JPRS-UMA-85-005

16 January 1985

USSR Report

MILITARY AFFAIRS

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MILITARY-POLITICAL ISSUES

OUTSTANDING NAVAL POLITICAL OFFICER

Moscow KRASNAYA ZVEZDA in Russian 4 Dec 84 p 1

[Article by Sr Lt N. Litkovets, Red Banner Pacific Fleet, under the rubric "Outstanding People of Army and Navy": "Keeping up to the Mark"]

[Text] "Any arguments?" asked Sr Lt A. Ladygin, and he blushed from emotion. "Yes, quite a few. And a very important one, since the fate of a man is involved. And how are we dealing with him? Ship him out of the collective, to shore, in fact. Let someone else worry about his training."

The Komsomol secretary spoke heatedly and energetically. He firmly maintained that it was out of the question to strike sailor S. Shishlov from the ship's roster. That is no way to lose a man from the crew. And this firmness and sincere concern of the VLKSM /Komsomol/ committee secretary could not fail to please the ship's deputy commander for political matters, Capt 2d Rank A. Kamnev. Listening to the young officer's agitated voice, he was more than convinced that he had not made a mistake in recommending Ladygin for the Komsomol job. Ladygin did not need to borrow energy or initiative. He knew how, without fuss or show, to motivate and target young people toward the successful accomplishment of their assigned tasks. The political worker had noticed something else, however. He did not often see the secretary among the sailors. People did not throng to him to share their problems or to have heart-to-heart talks.

"I am always ready to listen and give advice," Ladygin replied in puzzlement, with a shrug of his shoulders.

"Well it seems to me that you are not yet ready," the political deputy remarked. "Besides, listening and giving advice is not the main thing in working with people. It is much more important to know how to understand a person, to penetrate deeply into what is troubling a colleague, and if necessary, to defend a comrade."

As he spoke, he automatically recalled when he first took up the duties of deputy commander for political affairs on the submarine. The crew was getting ready for a long cruise. One day Kamnev was approached by the executive officer. He started up a conversation about Lt V. Shumeyko.

"There's an expert for you. He's nothing great and won't get any better. He's been given punishments. He might let us down at sea. Wouldn't it be better to replace him with an officer from another ship's company?"

"No doubt," answered Kamnev. That was to be a lesson to him.

That evening, recalling the recent conversation, he started to think. How could he act like that? What right did he have, without even having spoken to the man, to judge him so harshly? In the morning he sought out Shumeyko, and from him he went to the commander. He insisted that the officer remain in the ship's company.

On the cruise Lt Shumeyko did not let the company down. And largely because of the political officer's help. And in later years, you wouldn't know him. His performance was outstanding!

And how many such cruises Capt 2d Rank Kamnev has had! And every one was not just a trial of his professional maturity, but also a discovery of people and of himself. He taught the collective and he himself learned from the ship's company. The people grew ideologically, spiritually and morally. And he grew, too.

And his belief also grew in one apparently very simple but important rule of life. Everybody knows how eager people feel when they start out on something new, when they are turning a new page in their life. But it often happens that when they get used to it they are no longer so energetic or responsive. But we should do everything as if it was for the first time.

From time to time the ship's company was amazed at the energy of the young political officer and his unflagging striving for innovation. He always tried to be, so to speak, at the top of his form. One time he was assisting at a political class in a group of seamen. It was pretty boring, without any liveliness. He spoke to the instructor about this, and was told: "Well, the situation here is all wrong. When we get back to base, then it will be lively."

"You are wrong," sternly replied Kamnev. "We are in a situation right now where we all have to be at the top of our form -- to perform our combat mission and to carry out any function."

And he himself was constantly a personal example of how to keep up to the mark.

...Ladygin looked expectantly at the political officer.

"Well, you have convinced me." Kamnev smiled.

It almost seems that this conversation took place recently. But time has passed. Officer V. Shumeyko has a good reputation, and Michman 1st Class

S. Shishlov has transferred to the reserve with an excellent speciality. Sr Lt A. Ladygin has become a real youth leader and participated in the All-Army Conference of the Secretaries of Komsomol Organizations. The destinies and the formation of these people and of those who now make up the company of this excellent ship are due in full measure to holder of the order "For Service to the Homeland in the USSR Armed Forces" third class, Capt 2d Rank Kamnev -- a man with a warm heart.

12697
CSO: 1801/76

RECOMMENDATIONS FOR NEW POLITICAL TRAINING THEMES

Moscow KRASNAYA ZVEZDA in Russian 4 Dec 84 p 2

[Article: "Forward with the Responsible Tasks: How to Conduct Study Sessions on the Speech of Comrade K. U. Chernenko at the Meeting of the CPSU Central Committee Politburo and on the Materials of the Second Session of the USSR Supreme Soviet"]

[Text] Widespread study and explanation are presently going on in the army and navy of the speech of Comrade K. U. Chernenko at the meeting of the CPSU Central Committee Politburo and of the materials of the Second Session of the USSR Supreme Soviet. It is proposed to hold classes at all levels of political instruction in order to study them in depth. Four to six hours of training time will be devoted to this in the political study program for soldiers, sailors, sergeants and senior sergeants, four hours in the political training program for junior lieutenants and michmans, one seminar session in groups of Marxist-Leninist training for officers and generals, and two sessions in universities of Marxism-Leninism, in schools for party activists and in the entire system of party and ecomonic education and of communist political training.

It is recommended to explore the following topics in these political studies:

1. The speech of K. U. Chernenko as a program of action for the Soviet people to perfect the development of socialist society.
2. The country's confident advance on the path of economic and social development.
3. Tasks of Soviet servicemen to improve the combat readiness of the armed forces on the basis of the decisions of the October Plenum of the CPSU Central Committee, the Second Session of the USSR Supreme Soviet and the observations of Comrade K. U. Chernenko on matters of defense.

These topics may also be used as the basis for and in the conduct of study sessions with junior lieutenants and michmans and with officers.

One must approach the selection of methods of conducting political studies with consideration for the general educational level of the soldiers, sailors, sergeants and senior sergeants, and their conditions

of service. The preferred method is oral presentation with lively two-way discussion.

By way of introduction one should say that our country is approaching the end of another work year. The Soviet people are getting ready to start the final year of a five-year plan that is unusual in many ways. This will be the year of active preparations for the 27th CPSU Congress and the year of the 40th anniversary of the victory of the Soviet people in the Great Patriotic War. "There is no doubt," observed Comrade K. U. Chernenko in his speech at the meeting of the CPSU Central Committee Politburo, "that all this will lend a special political tone to the great work that awaits us in the new year."

In reviewing the first topic it should be noted that a meeting of the CPSU Central Committee Politburo took place on 15 November which considered the drafts of the State Plan for the Economic and Social Development of the USSR and of the USSR State Budget for 1985. Comrade K. U. Chernenko, General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, delivered a great speech at the meeting.

The CPSU Central Committee Politburo basically approved the drafts of the plan and budget for 1985, and adopted the observations and conclusions contained in the speech of Comrade K. U. Chernenko as the base for the activities of all party, government, and economic agencies, public organizations and labor collectives.

The speech of Comrade K. U. Chernenko at the meeting of the CPSU Central Committee Politburo serves as the model for the party's creative and workmanlike approach to the solution of vitally important problems. It contains an in-depth Marxist-Leninist analysis of the state of affairs in the economy, sets forth the action program worked out for the final year of the five-year plan, and defines the further strategy of work to improve developed socialism.

Study sessions are required to lay out and explain the current tasks of the economic policy advanced by Comrade K. U. Chernenko, especially in the areas of accelerating scientific and technical progress, enhancing and increasing the efficiency of production growth, tightening in every way the policy of economizing on labor and material resources, improving production, planning and contract discipline, and improving the system of economic management and control.

In reviewing the second topic one should dwell on the significance of the results of 1984. The main point is that the economy has started to develop more dynamically. The past two years have been marked by positive achievements in nearly all branches of the national economy. The average annual growth of industrial production reached 32 billion rubles in 1983-84, which is 1.5 times greater than the first two years of the five-year plan. Operations of railroad transportation improved. The

ahead-of-schedule opening up of the entire route of the Baykal-Amur Trunk Line to operational traffic is of great political and national economic importance. Reassuring changes are also taking place in agriculture, and they were discussed in detail at the October (1984) Plenum of the CPSU Central Committee. Labor and production discipline have been strengthened.

The changes that have occurred have had a favorable effect on the Soviet people's standard of living, and have accelerated growth in the real income of the populace. And this is the main criterion for the correctness of the party's economic policy and the soundness of the line it has developed.

During study sessions attendees should get an in-depth understanding of the trend and the specifics of the State Plan for Economic and Social Development for 1985. The plan is strenuous but realistic and fulfillable. It is based on the decisions of the 26th Party Congress, the subsequent plenums of the CPSU Central Committee and the observations and conclusions contained in the speeches of Comrade K. U. Chernenko on the key issues of economic development, improving the people's standard of living, and ensuring a reliable defense capability for the country. The general economic indicators by which it defines growth rates for the national economy are higher than in the preceding years of the five-year plan. It lays stress on enhancing social production. There will be substantial development of the industries of the fuel and energy system. The gas industry and nuclear power will develop at high rates, as they have in the past. Responsible tasks have been levied on metallurgy and machine building.

Great attention has been devoted to agriculture and to supplying it with up-to-date equipment and mineral fertilizers. Here brief mention should be made of the soil improvement program advanced at the October (1984) Plenum of the CPSU Central Committee.

Provision has been made for further growth in the material and cultural standard of living of the populace, and a comcomitant development in the construction of housing and social-domestic facilities.

In conclusion the class instructor should mention that the party is calling on workers to for persistence in adapting the advances of science and engineering to production and in discovering and making fuller use of additional resources.

With regard to the <u>third topic</u> it is important to stress that the problems of building communism in our country are being solved under difficult international circumstances, which are becoming more acute due to the reactionary imperialist circles of the United States and its allies in the NATO bloc. Under cover of false professions of desire for peace, the Washington administration is heightening international tension and relying on the crude use of force, and it has inflamed the arms race to

highly dangerous limits.

The Soviet Union, along with other socialist countries, is doing everything in its power to halt the dangerous development of affairs in the world arena, improve the international climate and steer intergovernmental relations onto the path of disarmament and cooperation. By its major international initiatives our country has demonstrated a constructive approach to world problems.

However, on sober analysis of the international situation, the CPSU Central Committee and the Soviet government have taken steps to increase the security of the USSR and its friends and allies and to improve the combat readiness of our armed forces. The Soviet Union does not seek military superiority, but it will not permit the military strategic balance that has been achieved to be upset.

The instructor should remind his listeners that under the conditions of an increasing military threat, servicemen are called on for undeviating improvement in the combat readiness of subunits /podrazdeleniye/, units /chast'/ and ships, and to direct their efforts toward high-quality performance of training plans and in-depth mastery of complex contemporary equipment and toward further improvement in efficiency and order. Study sessions should bring out the importance of performing the tasks laid out for the army and navy in the new training year in the context of the socialist competition under the slogan "Our selfless military labor for the 40th anniversary of the Great Victory and the 27th CPSU Congress!"; dwell on the results achieved by personnel in the last training year; and review the socialist obligations undertaken by servicemen.

In order to ensure the high ideological, theoretical and methodological level of the impending study sessions, group leaders must be thoroughly briefed. It is important to enlist command and political leaders and the most experienced and qualified propaganda cadres to explain the speech of Comrade K. U. Chernenko at the meeting of the CPSU Central Committee Politburo and the materials of the Second Session of the USSR Supreme Soviet.

All the work of studying and explaining the speech of Comrade K. U. Chernenko and the materials of the Second Session of the USSR Supreme Soviet should be aimed at the full and high-quality accomplishment of the tasks set out by the USSR Minister of Defense for the new training year.

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12697
CSO: 1801/76

FRG TERRITORIAL ARMY DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 84 (signed to press 7 Sep 84) pp 29-35

[Article by Lieutenant Colonel O. Dmitriyev: "The FRG Territorial Army"]

[Text] In following the aggressive course of the US and NATO, the military and political leadership of the FRG continues to build up the military might of the Bundeswehr--the bloc's strike force in Europe. In so doing, at the center of the West German government's attention is the Army and an integral part of it--the Territorial Army, in which, along with equipping it with modern weapons, a set of measures is being conducted to increase the combat and mobilization capabilities and improve field training of units (soyedineniya, chasti) and subunits (podrazdeleniya).

As West German military press reports, in accordance with organizational development plans of the Bundeswehr ground forces, the Territorial Army was reorganized between 1981 and 1983. This was done in order to increase significantly their fighting capabilities and readiness and to establish battleworthy units which can conduct combat operations both independently and as part of the ground forces of the Bundeswehr and NATO.

As a result of the transition to the new organization and establishment, based on six Heimatschutz [Home Defense] commands, six brigades of these troops were formed (the 51st through 56th brigades, one in each military district) which are combat-ready units even in peacetime. According to views of Bundeswehr command authorities, they can successfully perform assigned missions in all types of combat jointly with units of the ground forces. In addition, one equipment-holding Heimatschutz brigade has been formed in each district of the Territorial Army (61st through 66th brigades). Also, 15 Heimatschutz regiments, 150 companies and 300 security platoons have been established and placed under the region and subregion defense headquarters (in peacetime these are equipment-holding units and subunits).

According to foreign military press data, the current personnel strength of the Territorial Army is over 50,000. In wartime or in the event of a crisis situation, it can increase to 500,000 after complete mobilization. Their inventory includes about 700 tanks, more than 600 field artillery guns and mortars and in excess of 600 antitank weapons, including about 300 ATGM (antitank guided-missile) launchers.

The military and political leadership of the FRG is making every effort to ensure that after the reorganization the Territorial Army is fully prepared to carry out those missions allotted them in the Bundeswehr and NATO plans. In its opinion, the primary ones include accomplishing measures for territorial defense of the country to ensure freedom of maneuver for NATO joint armed forces on FRG territory, conducting combat operations as part of ground forces units or independently on separate axes, logistical and medical support of its own and allied forces, replacement of ground forces personnel casualties, organizing cooperation between military and civilian agencies and so forth.

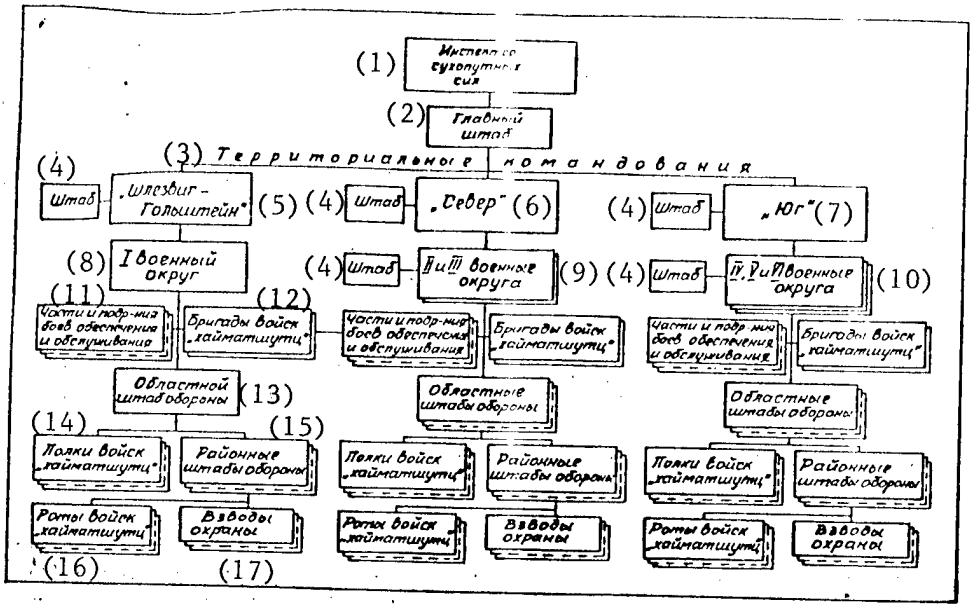


Figure 1. Organization of the Bundeswehr's Territorial Army

Key:

1. Inspector of the Ground Forces
2. Main HQ
3. Territorial Commands
4. HQ
5. Schleswig-Holstein
6. North
7. South
8. I Military District
9. II and III military districts
10. IV, V and VI military districts
11. Combat support and service units and subunits
12. Heimatschutz brigades
13. Region Defense HQ
14. Heimatschutz regiments
15. Subregion Defense HQ
16. Heimatschutz companies
17. Security platoons

As foreign press reports, one of the primary conditions of ensuring the freedom of operational maneuver of troops on West German territory, which has decisive importance and helps them advance to operational areas in the prescribed times, is the defense of rear areas by the Territorial Army. Its missions include, in particular, preventing the capture of important objectives and sectors of the terrain by the enemy, airborne and amphibious assault landing forces, force grouping that have broken through and also by commando-type groups. Special attention is give to the protection of

communications lines, pipelines, communication routes and installations on them which if knocked out action could substantially impede the advancement and deployment of ground forces units in operational areas and disrupt command and control, communications and troop cooperation. In addition, for these purposes it organizes traffic control along highways and railways, supports troop negotiation of water obstacles, minimizes the effects of the enemy using weapons of mass destruction, erects artificial obstacles and conducts repair and recovery work on the terrain and at installations.

In planning combat operations of a coalition grouping of forces in the Central European and Northern European theaters of military operations (TVD), the Bundeswehr proceeds from the fact that in June 1982 it was decided that six Heimatschutz brigades (51st through 56th) would become operationally subordinate to the corresponding NATO joint commands during a threatening period.

According to foreign military press data, the Territorial Army is broken down into 3 territorial commands (Schleswig-Holstein, North and South) which are made up of 6 military districts (corresponding to the country's military administrative division), 29 region and 80 subregion defense headquarters. The combat formations of the Territorial Army are represented by Heimatschutz brigades, regiments and companies and security platoons (Figure 1).

The territorial command is the primary link in the command and control system of the Territorial Army. Its commander, subordinate to the Bundeswehr Ground Forces Inspector General, manages subordinate units and subunits through his headquarters, headquarters of special commands (communications, engineer, medical and supply) and the headquarters of the military districts. The area of responsibility of a territorial command includes the territory of one to three military districts. Within it cooperation with the corresponding organs of the NATO Allied commands in the Central and Southern theaters is organized.

As West German press notes, the area of responsibility of the Schleswig-Holstein Territorial Command (HQ in Kiel) includes the lands of Schleswig-Holstein and Hamburg. Its HQ simultaneously performs the functions of HQ I Military District and coordinates with the NATO Allied Command in the Northern Theater.

The North Territorial Command (Mönchengladbach) organizes cooperation with the Northern Army Group (NORTHAG) and with the 2d Allied Tactical Armed Forces (ATAF) of NATO in the Central European Theater and includes the II (the lands of Lower Saxony and Bremen) and the III (North Rhine-Westphalia) military districts.

The South Territorial Command (Heidelberg) includes the IV (lands of Hessen, Rhineland-Pfalz, Saar), the V (Baden-Württberg) and the VI (Bavaria) military districts. The commander of the South Territorial Command organizes cooperation with the Central Army Group (CENTAG) and the 4th ATAF of NATO in the Central European Theater.

As foreign military press reports, the commanders of the territorial commands, in close cooperation with federal government agencies, develop plans to ensure the freedom of operational maneuver of NATO Allied Armed Forces in their areas of responsibility. In so doing, they coordinate completion of the most

important tasks of defending rear areas and key installations with the headquarters of the corresponding commands of the Allied Armed Forces. Planning, conducting and monitoring measures for logistical and medical support of the ground forces, replacement of personnel casualties and also coordination of combat operations of Territorial Army units is accomplished by special commands (communications, supply, engineer and medical) which are included organizationally in each territorial command, military district headquarters and their subordinate special units and subunits.

A military district is a part of a territorial command. Its area of responsibility covers the territory of one or several lands. The military district commander controls subordinate units of the Territorial Army and organizes cooperation with the headquarters of army corps and state authorities. According to foreign press information, he has subordinate to him from one to seven region defense commands, one combat-ready and one equipment-holding Heimatschutz brigade and combat support and service units and subunits: engineer, medical, protection from weapons of mass destruction, transport and military police.

As West German military specialists note, it is the district's main job to carry out the tasks levied on the Territorial Army. In addition, the district forces also include Heimatschutz brigades which are the best-trained combat units of the Territorial Army and are capable of conducting all types of combat operations both jointly with NATO Allied ground forces and independently.

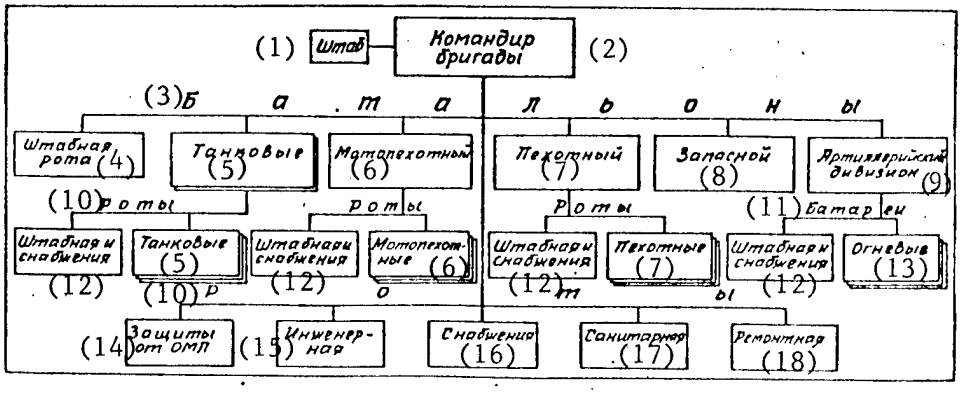


Figure 2. Organization of a Heimatschutz Brigade (combat-ready)

Key:

1. Hq
2. Brigade commander
3. battalions
4. Hq company
5. tank
6. motorized infantry
7. infantry
8. reserve
9. artillery
10. companies
11. batteries
12. Hq and supply
13. fire
14. protection from weapons of mass destruction
15. engineer
16. supply
17. medical
18. repair

The region defense headquarters is subordinate to the military district headquarters. Its area of responsibility includes the territory of the administrative district of the FRG. The region defense headquarters commander organizes cooperation with the division commanders located in his area of responsibility and with the administrative district authorities.

Subordinate to the region defense headquarters are the subregion defense headquarters (one to five) and also subunits of engineer troops, communications and supply. If there are important military or state installations located in its area of responsibility, a Heimatschutz may be subordinated to it. As noted in foreign press, the headquarters is tasked with security and defense of rear areas of divisions and installations jointly with other military units and police forces. In specific cases, it may be tasked to defend an installation outside of its area of responsibility.

The area of responsibility of a subregion defense headquarters encompasses the territory of several of the country's administrative regions. Heimatschutz companies, security platoons and replacement battalions are subordinate to its commander. He organizes cooperation with the brigade headquarters of ground forces and with the authorities of the administrative regions. According to West German press, the subregion defense headquarters is responsible for the security and defense of important installations and also for the formation of replacement battalions whose personnel are intended to replace casualties in FRG ground forces units.

As foreign press reports, the combat formations of the FRG Territorial Army include Heimatschutz brigades, regiments and companies as well as independent security platoons.

A Heimatschutz brigade (combat-ready) is a mechanized unit under the command of a military district headquarters of the Territorial Army. In peacetime, the brigade is manned at a 52-85 percent level and is fully equipped with weapons and combat equipment. The West German command considers it equivalent in terms of fighting capabilities to a motorized infantry brigade of the ground forces.

According to foreign press data, a brigade includes (Figure 2) 6 companies (Hq, defense from weapons of mass destruction, engineer, supply, medical and repair), 2 tank battalions (with 41 M48 tanks each), 1 motorized infantry battalion (more than 30 M113 armored personnel carriers's, 7 self-propelled 90-mm Jagdpanzer antitank guns, 12 Milan ATGM launchers, six 120-mm self-propelled mortars) and also 1 artillery battalion (eighteen 105-mm howitzers) and 1 reserve battalion. In all, the weapons inventory includes 82 tanks, 25 ATGM launchers, 14 self-propelled 90-mm antitank guns, eighteen 105-mm howitzers and twelve 120-mm mortars. Personnel strength is about 3,000 men.

In the opinion of West German military specialists, a brigade is capable of conducting all types of combat operations jointly with NATO and Bundeswehr ground forces units and also performing combat missions to destroy airborne and amphibious assault landing forces which have broken through and enemy groupings which have been encircled and also to eliminate breaches and cover gaps in individual sectors. When necessary, a brigade can be called upon for

independent execution of missions of security and defense of the most important installations and areas of the terrain.

Bundeswehr and NATO command authorities focus much attention on increasing the combat and mobilization capabilities of these brigades. They are actively involved in exercises of the national ground forces and in maneuvers of the NATO Allied forces. As foreign press reports, in 1982 the 52d Brigade participated in the exercise "Starke Wehr" of the FRG I Army Corps and in 1983 the 54th Brigade was totally involved in the III Army Corps exercise "Wehrhafte Loewen".

A Heimatschutz brigade (equipment-holding) is a unit which is manned at about 10 percent and fully equipped with weapons and combat equipment. It includes 3 companies (Hq, engineer and supply), 1 tank battalion (41 M48 tanks) and 2 infantry battalions (each with 12 Milan ATGM launchers, 7 self-propelled 90-mm antitank guns and 6 mortars) and 1 artillery battalion (eighteen 105-mm howitzers). In all, a brigade is authorized 24 ATGM launchers, 14 self-propelled 90-mm antitank guns, eighteen 105-mm howitzers and 12 mortars. Personnel strength is over 2,500 men.

According to foreign military press information, the basic mission of a brigade when fully manned is similar to the previous one. At the same time, it is stressed that the NATO command views equipment-holding Heimatschutz brigades as a reserve for reinforcing the bloc's ground forces groupings.

A Heimatschutz regiment is subordinate to the region defense headquarters commander and is an infantry equipment-holding unit manned at 10-percent strength and equipped at 100 percent with various weapons and combat equipment. Upon announcement of mobilization, motor vehicles of various carrying capacities arrive at the regiment from civilian organizations.

In a regiment there are three infantry battalions and three companies (Hq, mortar and supply). In the first there are ten 106-mm recoilless guns and in the second--eighteen 120-mm mortars. An infantry battalion includes a Hq company, a supply company and four infantry companies. In all, a regiment has over 3,000 men, eighteen 120-mm mortars, ten 106-mm recoilless guns and twenty-one 20-mm guns.

As foreign press stresses, a regiment will be used mainly for security and defense of terrain sectors and installations, but in specific cases may be used for conducting combat operations in cooperation with units and subunits of the ground forces, carrying out missions to destroy enemy assault forces and small groups, to contain them at favorable lines on the terrain and to seal off the enemy before he reaches until their own forces arrive. The Bundeswehr ground forces command regularly involves these units in exercises to practice these missions. Thus, in 1983, during an exercise of the IV Military District, the 74th Heimatschutz Regiment was brought up to wartime strength and used for installation security in the rear area of its own forces.

A Heimatschutz company is subordinate to the commander of the subregion defense headquarters. It consists of four infantry platoons with four squads each (one Hq section and three infantry squads). It is equipped with rifle

weapons and grenade launchers. In all, it has about 200 men, up to 200 automatic rifles and automatic weapons and over 20 grenade launchers. In peacetime the company is an equipment-holding infantry subunit. It is involved mainly in installation security in the area of responsibility of the subregion defense headquarters, but in certain cases may be used for area defense.

A security platoon is subordinate to the commander of the subregion defense headquarters. In peacetime it is an equipment-holding subunit. Its authorized wartime manning is about 30 men. It has machine guns, rifles and grenade launchers in its inventory. The platoon is intended for security and defense of military and administrative installations and, depending on the size and importance, three to five platoons may be assigned to each.

The Territorial Army, just as in the armed forces, are brought up to strength under a mixed principle: by calling to active duty those subject to military duty, by regular servicemen and by volunteers (under contract). In the opinion of the country's military and political leadership, such a principle of manning meets to the greatest extent the Territorial Army's requirements for highly qualified specialists capable of quickly mastering and efficiently using weapons and military equipment. At the same time, it makes it possible to accomplish mass training and retraining of reserve personnel intended to be used (roughly 85-90 percent) to bring the Territorial Army up to wartime strength.

As foreign press reports, the Bundeswehr command is focussing increasing attention on reservist training. For these purposes, they are annually called to assemblies, mobilization exercises and maneuvers of the FRG ground forces and NATO Allied forces. In addition, measures are being taken to improve the system of retraining reservists and they are also planning to increase the number of TOE categories in the ground forces units intended to be filled by reservists (up to 6,000). This will make it possible, in the estimation of the ground forces command, to call up annually to assemblies and train about 150,000 men, a large part of whom will be designated to bring the Territorial Army up to strength.

In the opinion of West German military specialists, after completion of the reorganization and the transition of the Territorial Army to the new TOE, their capabilities increased for completing missions of supporting NATO Allied forces operations on the FRG territory and also for fulfilling measures under national plans. At the same time, they have started to support more effectively the arrival of Allied units on FRG territory and their rapid movement to designated areas. Specifically, an agreement was concluded between the FRG and U.S. governments in 1982 concerning support of American troops stationed on and transferred to its territory during a threatening period or in case of war. By 1987 it is planned to establish special units and subunits (transport and supply, repair and recovery, engineer, communications and others) in the Territorial Army for this purpose and also command and control organs for them with a total manning of over 90,000 personnel (in peacetime they are all equipment-holding units with up to 2,000 personnel). They will be able to accept 6 divisions and about 1,000 U. S. combat aircraft on the FRG territory in 10 days.

According to foreign press reports, in the interests of increasing the combat readiness and fighting efficiency of the Territorial Army, the Bundeswehr command envisions equipping it further with more modern weapons and military hardware, including Leopard-1 tanks, M109G 155-mm self-propelled howitzers, Marder infantry fighting vehicles, Luchs armored reconnaissance vehicles, communications equipment and automated command and control systems.

On the whole, in the opinion of the Bundeswehr command, the Territorial Army increases the fighting strength of the ground forces and its units are able not only to carry out missions in defense of the country's territory but also to conduct aggressive combat operations jointly with the ground forces.

12567
CSO: 1801/58

BRITISH LYNX-3 COMBAT HELICOPTER DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 84 (signed to press 7 Sep 84) p 40

[Article by Lieutenant Colonel V. Nelin: "New British Combat Helicopter"]

[Text] According to foreign press reports, the British company Westland is developing the Lynx-3 combat helicopter, designed primarily for an antitank role, based on the multipurpose WG-13 Lynx helicopter which has been in Great Britain's army aviation inventory since 1977. It is expected that its maximum takeoff weight, compared to its basic weight, will increase by more than 1,000 kg and will be 5,450 kg. Its combat load will also increase.

The propulsion system of the Lynx-3 consists of two British Rolls-Royce Gem-60 turboshaft engines with a maximum power of 1,350 hp each which provides it with a fairly high power-to-weight ratio and, consequently, good maneuvering characteristics. In place of the ski landing gear, the new helicopter has wheeled landing gear. The main rotor and tail-rotor blades are made of composite materials and are contoured to reduce noisiness. Steps have also been taken to increase survivability and a number of design improvements have been made. In addition, new onboard electronic and instrument equipment has been installed on it providing for day-night and adverse weather operation.

The Lynx-3 helicopter has the following geometric dimensions: maximum length (with rotating blades)--15.47 m; height--3.34 m; main rotor diameter--12.8 m. Flight cruising speed is 260 km/h, maximum range is over 700 km and endurance is 3.5 hours.

It was reported in foreign press that Tow, Hot and Hellfire ATGM's (antitank guided missiles) as well as their new modifications under development are being considered as its antitank armament. The Hellfire, developed by the American firm Rockwell and equipped with a semiactive laser homing head, is considered the most preferable missile. It has undergone firing tests on the WG-13 Lynx and foreign experts expect that Great Britain may become the first foreign buyer of this ATGM.

The missiles are hung, four each, on two launchers along the sides of the fuselage. In addition, eight more ATGM's for reloading the launchers under field conditions during mission execution can be placed in the helicopter's cargo compartment. For airborne defense, especially against helicopters, launchers for the air-to-air variant of American Stinger guided missiles can be installed on the sides of the fuselage (two on each side). A 20- or 30-mm cannon is planned to be included as part of the helicopter's armament for striking poorly protected targets.

According to the magazine INTERAVIA, the basis of the Lynx-3 helicopter's fire-control and navigation equipment will be the TADS/PNVS electro-optical system currently installed on the new American AH-64A Apache helicopter gunship. It is designed for reconnaissance, target designation and flight operations support at extremely low altitudes, day and night under visual and instrument weather conditions. One of the variations of positioning this system's sensors being studied is placing them on the mast above the main rotor hub. It is noted that this variation has advantages from the standpoint of better scanning and the capability of conducting combat operations from behind shelters, but entails certain technical difficulties, primarily with ensuring the required stabilization.

Flight testing of the Lynx-3 helicopter began in mid-1984. Series production is scheduled to start in the late 1980's.

12567
CSO: 1801/58

U.S. ANTISATELLITE PLANS DISCUSSED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 84 (signed to press 7 Sep 84) pp 43-46

[Article by Colonel V. Viktorov: "The U.S. on the Way to Militarization of Outer Space"]

[Text] The efforts of the Soviet Union and certain other countries led to the conclusion in the 1960's and 1970's of a number of international agreements which partially limited the use of space for military purposes. In 1981 the USSR, true to its peaceloving policy, introduced at the United Nations a proposal to ban the deployment of any kind of weapons in outer space. But up to now the United States has blocked the drafting of such an agreement. What is more, today peoples of the world are seriously alarmed by the sinister plans of the American imperialist circles striving to turn space into a theater of military operations. In his response to the appeal of American scientists, General Secretary of the CPSU Central Committee and Chairman of the USSR Supreme Soviet K. U. Chernenko comprehensively assessed the irresponsible steps of the Pentagon strategists: "Outer space has become a symbol of the vast achievements of science and technology. Its peaceful development yields great fruits. However, some people would like to turn space into a bridgehead of aggression and war. As is clear from the plans announced in the US, they plan to deploy anti-missile weapons in space, give full play for operation of a variety of antisatellite (ASAT) systems and deploy extremely new types of weapons designed for striking targets on the earth, in the air and on the seas."

The Reagan Administration is placing the space programs in direct dependence on the plans to improve the armed forces. Foreign press has quoted statements of official U.S. Defense Department representatives that international treaties and agreements on banning or limiting deployment of weapons systems in space must not be contrary to the interests of "the country's national security". The very development of space technology in the United States is being linked increasingly more closely to the development of new weapons systems. Thus, on 6 January 1984 the President signed Directive No 119 directing to begin implementation of a wide-scale program of scientific research on establishing weapons systems in space, allegedly capable of protecting the territory of the US from a massive nuclear missile strike. This confirmed earlier announced decision to begin development of space-based anti-missile complexes. Judging from foreign press reports, the Pentagon intends to develop space systems equipped with weapons to strike targets both

in space and on the earth. Presently, primarily enemy satellites are being considered as targets for such systems and in the future--ballistic missiles.

Since 1958 about $150 billion has been spent on space programs in the US (one-third of this sum went to finance military programs). Expenditures for military programs are increasing from year to year and already considerably exceed those for civilian programs. For example, whereas in fiscal year 1982 the Defense Department budget allocated $6.4 billion for space programs and NASA's was $5.9 billion, in 1983 the Pentagon's budget had increased to $8.5 billion (33 percent) and NASA's to only $6.8 billion (15 percent). In fiscal year 1984 allocations for military space programs reached $14.1 billion which is triple those for civilian space programs. In the future this gap will be even more appreciable; in fiscal year 1987 it is planned to allocate $4 billion for civilian programs while allocating $20 billion for military programs.

The US began preparing to conduct military operations in space more than 20 years ago when it conducted an experiment on 19 October 1959 in which the Explorer-6 satellite was intercepted by a missile launched from a B-47 bomber. In 1964 on Kwajalein atoll (Pacific Ocean) American ground forces deployed a ground ASAT complex (program 505 Nike) based on Nike-Zeus anti-missile missiles. It was dismantled in 1967.

During this same period the USAF command on Johnston atoll (Pacific Ocean) set up a ground ASAT complex based on Thor missiles (program 437 Thor). It included two ground missile launchers, two command transmission stations and a satellite tracking radar. Between 1964 and 1970, 16 launches of ASAT missiles were conducted from here. According to Western press reports, the complex's equipment was dismantled in 1976. At the same time, it is noted that if necessary it can be set up in a 6-month period.

Today, in striving to achieve military superiority over the Soviet Union and to develop the necessary potential to inflict a first, disarming strike, the Pentagon has stepped up work in the area of ASAT weapons being accomplished under three basic programs. Under the first program an airborne missile system for intercept of satellites is being developed. Within the framework of the second a search is being conducted for the optimum designs to build space defense systems using space missile technology. The third program involves studying the possibilities and effectiveness of striking satellites using high-energy lasers. American military specialists believe that using an airborne missile system for intercept is more effective than special satellites and less expensive than using lasers.

An airborne missile system for intercept has been under development by the American firms Vought, Boeing and McDonnell Douglas since 1977. It is designed to intercept satellites in low orbits. The complex includes an aircraft platform (a modified F-15 fighter) and a two-staged ASAT guided missile suspended under its fuselage. The missile's payload is a small-sized MHIV interceptor. The launching of the guided missile is planned to be accomplished at altitudes of 15,000-19,000 meters.*

* For more detail about the missile see: ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1983, No 4, pp 45-47.

The first launch of an experimental ASAT missile from an F-15 aircraft against a hypothetical space target was made in early 1984 at the Western Missile Test Range of the US (Vandenberg AFB, California).

Its task, as foreign press indicates, was to check the functioning reliability of the guided missile's first and second stages and also the onboard equipment of the host aircraft. After launching at an altitude of 18,300 meters, the missile was brought to a specified point in outer space. In place of the small-sized interceptor, a weighted mock-up of it was installed on the guided missile along with telemetry equipment which transmitted flight trajectory parameters to earth. Radio aids of the Western Missile Test Range and the optical tracking station in the Hawaiian Islands were used to track the ASAT missile.

Twelve flight tests are planned to be conducted under the program for developing an airborne missile system for intercept. During the second one, planned for the fall of 1984, it calls for equipping a missile with a miniature interceptor with an infra-red guidance system. It is supposed to lock on to a specific star which will make it possible to determine its capability for precision guidance of the interceptor to a specific point in space. Beginning with the third test, the interceptor is supposed to strike target-satellites put into low orbit by Scout missile carriers from the test range on Wallops Island.

Initially, the American ASAT system will include 28 F-15 host aircraft and 56 ASAT missiles. Two squadrons of aircraft are stationed at Langley AFB (Virginia) and McChord AFB (Washington). Later the number of host aircraft is expected to reach 56 and the number of missiles--112. Operational readiness of the complexes is scheduled to begin in 1987. Organizationally they will be under the USAF Space Command and control of the intercept will be accomplished from the NORAD Space Defense Center Command Post. They do not hide the fact in American military circles that the ASAT weapon is designed to destroy Soviet space objects, including the Salyut orbital station.

According to a statement by USAF representatives, ASAT complexes deployed in the continental United States will be able to ensure interception of only 25 percent of the satellites located in low orbits. Therefore, in its desire to develop a global ASAT system the Reagan Administration is trying to obtain the right to use air bases on foreign territories for aircraft missile intercept complexes, especially in the Falkland (Malvinas) Islands and in New Zealand. In addition, problems of aerial refueling of F-15 host aircraft and also refitting F-14 deck fighters as ASAT missile carriers are being resolved practically.

Expenditures for developing the ASAT system are estimated by USAF specialists at $4.24 billion, of which $1.35 billion will go toward development, $2.5 billion toward purchase and $0.39 billion toward military construction. According to a statement by the congressional General Accounting Office, this sum is considerably more and will exceed $10 billion.

To intercept satellites located in higher orbits (up to 1,500 km) it is suggested to improve the ASAT missile. Presently the USAF rocket engine

laboratory is conducting research for the purpose of building a more powerful second-stage engine for the ASAT missile. Specifically, they are considering an engine with a titanium body and nozzle made from a carbon-based composite material which will operate on a new fuel. They are also planning to replace the first-stage engine with a solid-fuel rocket engine with a body of composite material and which operates on fuel used in ICBM's, but adapted to conditions of a high-altitude launch. American specialists estimate that the work to improve the ASAT missiles can be done over a period of 2 years given allocations for these purposes in the sum of $2 billion. In addition, an interceptor variant based on the Trident missile is being developed to intercept satellites located in a stationary orbit.

It is noted in foreign press that in considering space-based ASAT systems, the US gives preference to maneuvering orbital platforms equipped with relatively low-power lasers, chemical ones for example, having a radiating power of 0.25-0.30 MW (mirror diameter of 2.85 meters). It is planned to put the platforms in so-called holding orbits, on command maneuver them to close in on the target to a distance of about 30 km and destroy the enemy satellite from this distance. In the opinion of USAF experts, the missions of the ASAT defense could be accomplished on a global scale by a system including 15 maneuvering platforms (7 in low orbits and 8 in a stationary orbit). They believe that such a system could make it possible to accomplish all ASAT defense missions in 24 hours, that its in-service time could reach 10 years and the costs for its development would be $13.7 billion.

At the same time, they are studying the possibility of developing non-maneuvering platforms equipped with chemical lasers with a radiating power of 10 MW (mirror diameter of 10 meters) which, they figure, would be able to perform other tasks along with their ASAT mission.

Under a cover of unsubstantiated allegations about growing threat to American satellites from potential enemy ASAT weapon systems, the US is hurriedly taking measures to ensure the protection of its space objects. They include placing false targets onboard, installing more powerful engines which make it possible to change the orbit to evade ASAT weapons and also equipment for electronic countermeasures (ECM) and recognizing the probability of an attack on a satellite. In addition, they are expected to develop more multipurpose satellites performing several functions at once, which, in the opinion of Pentagon experts, should increase the resistance of space systems to enemy interference. Concurrently with this, they are considering the possibilities of ensuring rapid replacement in orbit of satellites which have been knocked out.

The development of ASAT weapon systems may have a serious effect on the arms control process since it is closely linked to development of an anti-missile defense. This is graphically apparent in the example of the intercept complex being tested whose miniature missile interceptor is actually a non-nuclear combat component of an ABM system being developed to destroy ICBM warheads in the in middle phase of their flight trajectory. The assistant to the President for science also spoke in the same light when he stated directly that the development of a laser ASAT weapon would be the first stage in building a space-based ABM system.

It is noted in foreign press that the US is considering the possibility of developing so-called satellite mines, that is, a satellite with a charged device, which would constantly be up to several hundreds of kilometers from the target satellite and, on command, close in on it and detonate. American specialist believe that they must have good maneuvering capabilities and to disguise their true purpose will imitate the operation of other devices, commercial satellites for example.

The problem of preventing the militarization of outer space today is a pressing one since, as is emphasized in the Statement of the Soviet Government, "extending the arms race into space would increase the risk of a military catastrophe, undermine the prospects for limiting and reducing arms in general. There is a growing understanding of this everywhere and the demands are increasing to stop the development of events before it is too late. Everything must be done not to miss this opportunity to shut off reliably without exception all channels of the militarization of outer space."

12567
CSO: 1801/58

F-15 FIRE-CONTROL NAVIGATION SYSTEM DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 84 (signed to press 7 Sep 84) pp 55-57

[Article by Major O. Nikol'skiy: "The F-15 Fire-Control Navigation System"]

[Text] Foreign military specialists consider the F-15 Eagle tactical fighter to be one of the most advanced modern aircraft which can successfully conduct aerial battles and deliver strikes against ground targets. Judging from foreign press reports, the fire-control and navigational system provides for navigation under various weather conditions, detection, lock-on and automatic tracking of airborne targets with measurement of their necessary parameters, range calculation to selected ground targets, launch and guidance of guided missiles, firing from cannon and bombing, monitoring the efficiency of onboard electronic instrumentation as well as performing certain additional tasks.

The system is based on a central computer and includes the multi-functional AN/APG-63 radar, an optical sight, the AN/ASN-109 inertial navigation system, an aerodynamic parameter computer and a control panel. Auxiliary navigation equipment includes the AN/ARN-111 TACAN short-range radio system interrogator, the AN/APA-50 radio compass and a radio altimeter. In addition, the capability is provided for installing on the aircraft a Pave Tack electro-optical system pod. The information needed by the pilot to perform his various combat missions is presented on displays on the forward instrument panel and on a heads-up display.

The Hughes AN/APG-63 multi-functional pulse-Doppler radar is designed for search, detection, parameter measurement and automatic tracking of airborne targets (including during a dogfight), ground target ranging and radio-beacon navigation. The AN/APG-63 radar, installed in the nose section of the aircraft, operates in the 3-cm wave band and can detect low-flying targets. The transmitter uses a travelling wave tube which has a higher frequency stability of transmitted signals than the magnetron. A flat slotted antenna array serves for signal reception and makes it possible to scan over an azimuth within ±60 degrees and an angle of sight of ±10 degrees. The antenna is round (914 mm diameter). It has 12 dipoles installed, used in the identification system which operates in the 1.1 GHz range. The antenna is situated in a radioparent dome in a pod, stabilized in pitch, roll and yaw and controlled by means of a hydraulic drive.

The radar has high, medium and low pulse repetition frequency which ensures detection and automatic tracking of airborne targets in a wide range of altitudes and speed ranges. In addition, it provides for a special "close-in dogfight" mode in which it accomplishes automatic lock-on and tracking of the closest target at a distance of 0.2-18 km in a limited antenna scanning sector and within the field of view of the indicator. This makes it much easier for the pilot during a maneuvering dogfight which is characterized by rapid changing of the situation.

In the "air-to-surface" mode, the radar can measure the distance to a ground target with automatic bomb release, perform terrain mapping for sighting on an auxiliary aiming point during bombing and also measure ground speed for correcting data coming from the inertial navigation system.

It is noted in Western press that the F-15C fighter is equipped with an updated radar which, unlike that described above, also has the following operating modes: "tracking while scanning"--several airborne targets are tracked automatically, with simultaneous search in the entire scanning sector; "terrain mapping by a beam having a Doppler peaking"--the radar's angular coordinate resolution is increased significantly (four to eight times greater); "precise identification of moving ground targets"--detection of objects moving at speeds above 5 km/h. These improvements, as American specialist believe, have become possible due to the fact that a programmable processor is installed as the signal processing unit and, compared to the normal unit, has a considerably larger memory capacity and higher operating speed.

In the future it is expected that they will continue to upgrade the AN/APG-63 radar, specifically to introduce the mode "terrain mapping using a synthetic aperture" and also to use new radar methods of identifying airborne and ground targets.

The Honeywell optical sight is designed for visual detection of airborne and ground targets and output of the necessary data for firing the cannon and bombing. It includes a computer, an inertial platform and a heads-up display. The flight trajectory of the projectile is projected on the display screen in the form of a luminescent line with range markers on it corresponding to 300, 600 and 900 meters. The length of these markers is proportional to the wing span of the enemy aircraft which enables the pilot to determine the approximate distance to the target. When necessary, the distance measured by using the onboard radar can be fed into the computer, which considerably facilitates the process of conducting firing. Aiming is reduced to matching the target image and the flight path of the projectile by executing maneuvers in azimuth and angle of sight.

As foreign military specialists believe, the effectiveness of an attack depends to a great extent on the ability of the pilot to predict a maneuver in the process of aiming. In the earlier generation sights, the computer calculates the angle between the current target sighting line and the center line of the cannon, taking into account ballistic corrections and correction for target position change during the projectile's flight time, which are expressed in the form of deviations from the center mark relative to the

stationary initial position of the sight. A shortcoming of such a system is that the accuracy of the matching calculations and the end position of the target during the flight time of the projectile is relatively low. This is especially evident when conducting a close-in, maneuvering dogfight. Calculation of the target coordinates is usually done based on conditions of constancy of the target's angular velocity during the flight time of the projectile which sharply increases errors if the enemy uses various maneuvers. A considerable amount of time is required to prepare such a sight for firing and, as a result, its effectiveness is decreased in an aerial engagement.

In the opinion of Western specialists, the sight installed in the F-15 fighter by and large does not have these shortcomings and is almost instantaneously ready for firing. Among its negative aspects foreign experts include the inability to be used at night and in fog and also the significant operating range reduction during rain, snow and even in light ground haze.

The AN/ASN-109 (LN-31) inertial navigation system is the basis for accomplishing all navigational calculations. It determines the aircraft's position at an accuracy of 1.85 km in 1 hour of flight, provides data on the attitude of the aircraft, can measure the course, bank, pitch, ground speed and vertical acceleration and also makes it possible to determine the bearing and range to several earlier selected targets or flight points. The system consists of a measuring unit mounted on a gyroscopically stabilized platform, a digital computer, a control panel and a display. The aircraft's location, measured by using the AN/ASN-109, can be corrected according to data from the TACAN system, the onboard radar system operating in the "terrain mapping" mode or visually. The inertial unit contains two two-degree-of-freedom gyros and three accelerometers. The system is completely autonomous and does not need any ground support equipment. In flights at low altitudes it is the main means of navigation.

The AN/ARN-111 TACAN radio navigation system interrogator is designed to determine polar coordinates (azimuth and range) of the fighter relative to a ground radio beacon and the range to another aircraft having similar equipment onboard. This information is depicted on the display and input into the computer of the fire-control and navigational system and also used to correct the inertial navigation system. The interrogator includes a receiver-transmitter, a control panel and a display. The operating range of the radio navigation system is about 500 km and depends to a great extent on the altitude of the aircraft and the terrain relief. The accuracy of determining range is 50-200 meters and azimuth--about 1 degree. The equipment operates in the 960-1215 MHz frequency range which is divided into 252 channels and a measurement time of 3 seconds. The TACAN system can operate under any weather conditions day and night over territory equipped with a network of ground radio beacons. Its operating range is decreased considerably during flights at low altitudes and in mountainous terrain.

The necessary sighting information is displayed for the pilot on a heads-up display (the main one with a 20X20 degree field of view) and on a radar display (situation on a horizontal plane). In striking ground targets, two modes of bombing are provided for: with continuous calculation of impact points and an automatic mode. In the first mode the line of fall is

illuminated on the display and in the second there appears a bomb release signal and an azimuth mark for eliminating sighting error. In addition, in both modes a marker for pulling out of the dive illuminates, enabling the pilot to determine its moment in order to avoid getting the aircraft hit by its own weapons or colliding with the ground.

In combat with airborne targets, modes for using guided missiles and cannon fire are provided. In the first case, the possible launch zones illuminate and, in the second, the display shows a sight graticule, cross-hairs and flight path of the projectile. In both modes the display has data on the indicated airspeed, magnetic heading, barometric altitude, distance to the target and closure rate and also a target marker, a gyro horizon line and a line for attitude angle reading.

The radar display serves for displaying a radar image of the terrain, information on distance to the target, its azimuth and angle of sight, closing rate and zones of possible guided missile launches. It, as well as the heads-up display, can be used when attacking ground targets.

The fire-control navigation system is control from special panels on which the operating modes are determined and the weapon is selected. Cannon firing, missile launching and bomb releasing are accomplished by means of tumbler switches and buttons situated on the engine control lever and the aircraft control handle, without taking the hands off the controls and it is possible to switch from the "air-to-air" to the "air-to-surface" mode.

By the early 1990's, according to foreign press reports, considerable improvement of the navigation capabilities of the F-15 fighter is expected by installing on it receiver-displays of the NAVSTAR satellite navigation system. It will provide an increase in accuracy of determining the position of the aircraft (about 10 meters), regardless of the flight time, and also navigation during flights at low and extremely low altitudes.

It is also believed that the capabilities of the F-15 fighter in conducting aerial battles and attacking ground targets will expand as a result of using a new complex weapon and flight control system currently under development (it has been given the arbitrary designation Firefly). According to preliminary assessments of specialists at General Electric and McDonnell Douglas, this system will make it possible to carry out all combat mission levied on the aircraft more effectively. For example, the probability of hitting a typical target will double or triple, weapon use time will triple or quadruple and the survival rate of the aircraft will increase by an order of magnitude in bombing and firing at ground targets due to the capability of performing an evasive maneuver, incorporated into the sighting process.

It is planned in the near future to install Joint Tactical Information Display System (JTIDS) equipment on the fighter. It will be used to connect into the information network in a theater of military operations and to obtain target designation data from various systems (AWACS, for example). In this case, the aircraft will begin to receive information on targets located several hundreds of kilometers from it. The equipment will have the following characteristics:

operation in the 960-1213 MHz range, increased jamming resistance, information reception at a distance of up to 500 km from the repeater.

According to foreign press reporting, the aircraft may be equipped with the Pave Tack electro-optical system, situated in a removable pod, to increase significantly bombing and firing accuracy by guided bombs and missiles with laser homing heads. The system includes an forward-looking infra-red radar, a laser range-finder and target indicator, and a laser-spot tracking device. The system will make it possible to use guided bombs and guided missiles against heavily protected, low-contrast targets on the first pass at any time of the day in simple weather conditions which should increase the effectiveness of mission performance by the F-15 fighter in close air support and isolation of the combat zone.

12567
CSO: 1801/58

PAVE MOVER RADAR SYSTEM DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 84 (signed to press 7 Sep 84) p 58

[Article by Candidate of Military Sciences Lieutenant Colonel Yu. Klochko: "The Pave Mover Radar"]

[Text] In the intensive measures being conducted to prepare the armed forces for new aggressive wars, the Pentagon attaches exceptionally important significance to reducing the time from detection to destruction of enemy targets. In this connection, in recent years there has been a noted trend in the US towards the integration of reconnaissance, command and control and weapons systems. This trend is manifested in the development of so-called reconnaissance attack weapon systems which combine all three elements. Judging from foreign press reports, several types of reconnaissance attack weapon systems are being developed simultaneously, differing both in purpose and scale of use. One of these is the Assault Breaker system which is designed basically for destroying armored targets, but specifically tanks deep in enemy territory.

An element of this system is a radar system deployed on airborne platforms which includes a multifunctional radar. In the experimental version of the reconnaissance attack weapon system, a Pave Mover radar installed on the F-111 was used as such a radar. It provides for detection and tracking of ground targets and guiding missiles equipped with dispenser warheads with precision-guidance munitions to the targets and low-flying attack aircraft at a range of up to 200 km. Control of the radar and basic processing of reconnaissance data is accomplished at a ground control post of the system.

It is noted in foreign press that the Pave Mover radar operates in the 3-cm wave band and has a phased array antenna about 3 meters long with electronic control of the antenna directional pattern in a 120-degree sector. It is also possible to do mapping of small sectors of the terrain at a resolution of 3 meters. The radar, having an enhanced security mode, conducts detailed tactical reconnaissance over a 200-km^2 area. Radar data is displayed on a screen with the basic terrain features (for example, roads, bridges, lakes, rivers, etc.).

It is believed that the use of digital processing of the signal and electronic control of the antenna directional pattern enables the radar to operate

simultaneously in several modes and to have the capability of repeated and directed surveillance of a specific section of territory which ensures tracking of high-interest objects (tank columns, a crossing, an airfield). For a more thorough and repeated analysis of the image received at the station, the possibility of recording it on magnetic tape is also envisaged.

The Pave Mover will make it possible to determine the area occupied by a group of tanks (motor vehicles), the direction and speed of its movement as well as the type of formation (linear or square). To do this, they are investigating the possibility of displaying the information on a color screen on which the moving and stationary targets will be denoted by various colors and the variations in the movement of the targets will be transmitted by their hues.

During strike delivery, the Pave Mover radar simultaneously tracks group targets and the missiles homing in on them. After the launch of such a missile and during its flight trajectory, the data on the point of guidance is updated with the help of the radar and is fed into the onboard computer for flight corrections of the guided missile. Information on the area occupied by the battle formations of a tank group, the direction and speed of its movement and the type of formation (linear or square) must also be transmitted from the Pave Mover to the guided missile. This is needed for selecting the pattern of dispersion of the submunitions in the target area.

The information obtained by means of the radar can also transmitted to the aircraft of the strike groups which will make it possible to vector them over unfamiliar terrain on targets (regardless of the degree of mobility) and also on enemy tank and motorized infantry groupings advancing towards the front line. This will eliminate the need for aircraft approaching a target at low altitude to execute a climb maneuver in order to lock on.

In testing of the Assault Breaker reconnaissance attack weapon system at the White Sands Test Range (New Mexico), the Pave Mover prototype accomplished control of an F-4E attack aircraft flying at 140 meters for the purpose of leading it to a column of tanks located at a distance of 120 km and moving at about 18 km/h.

Judging from Western press reports, development of combat variants of the Pave Mover radar for the Air Force and Army Aviation is beginning in the current year. It is expected to be installed in the TR-1A or C-18 (based on the Boeing 707) reconnaissance aircraft in the Air Force and on the OV-1D Mohawk in Army Aviation.

12567
CSO: 1801/58

AMPHIBIOUS ASSAULT RECONNAISSANCE DISCUSSED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 84 (signed to press 7 Sep 84) pp 59-63

[Article by Captain 2d Rank V. Mosalev: "Reconnaissance in an Amphibious Assault Operation"]

[Text] In the aggressive preparations of the U.S. military and political leadership, a prominent role is assigned to the Marines who are the most mobile and well-armed troops, constantly ready for immediate air- and sealift to any region of the globe to suppress peoples' national liberation movements and to protect the predatory interests of the American ruling circles. The Marines are specially trained for participation in amphibious assault operations which the Pentagon considers to be a special form of offensive operations conducted by the Navy independently or in cooperation with the Army and Air Force for the purpose of capturing a beachhead to invade enemy territory.

Depending on the scale, objectives and composition of participating forces, Western military experts divide these operations into three types: an "invasion" (an operation of strategic importance), a "capture" (operational) and a "raid" (tactical). The preparation and conduct of any of these is accomplished in five stages: planning, embarkation of the landing force on ships and vessels, rehearsal of the landing, sea passage and the landing. Key requirements imposed on such operations include secrecy of preparation and speed in conducting them, but an indispensable condition of their success is quality reconnaissance support.

Reconnaissance, as noted in foreign press, is called upon to perform the following tasks: identify the enemy forces which are or may be involved in defense against the assault landing and also the nature of the coastline in the landing area and its equipment; select helicopter and paratroop landing zones as well as overflight routes to ensure bringing the helicopters and aircraft to these zones; reconnoiter roads and suitable routes for advance of the assault landing forces; destroy anti-assault-landing obstacles in the water and on land, observation and command posts, headquarters, control points and communications centers, missile and artillery sites and depots; neutralize enemy command and control and communications systems.

This article examines problems of conducting reconnaissance in a "capture" type of amphibious assault operation conducted by an expeditionary division in

the landing phase of the assault. In this case, as Western press emphasizes, reconnaissance forces may include an underwater demolition team (UDT), an independent reconnaissance company and one or two companies of a radio battalion, a reconnaissance battalion, a surveillance and warning platoon, nine target detection and surveillance platoons, a reconnaissance and observer air squadron, a photographic reconnaissance flight and an electronic warfare (EW) flight. In certain cases it may involve reconnaissance groups of a commando-type detachment from a Fleet special forces group.

The UDT (included in the fleet special forces group) is used primarily for conducting reconnaissance, destroying artificial and natural underwater obstacles in the assault landing area, clearing the approaches to the landing points, clearing passages in minefields in the water and at its edge, and marking movement lines and approaches of assault landing craft to the shore. As a rule, the UDT operates in a coastal area from a depth contour of 9 meters to the highest water level at high tide; however, it may be called upon to destroy anti-assault-landing structures on the shore as well. There are 15 officers, 100 noncommissioned officers and privates on a team. Organizationally, it consists of a HQ platoon and 4 underwater demolition platoons, each having 2 officers and 20 noncommissioned officers (NCO's) and privates. Usually the it operates in groups of 6 or 12 men each. The number of groups participating in an operation depends on its scale (thus, in a "capture" type operation there may be as many as eight). Personnel are trained for concealed landing from aircraft, helicopters, high-speed launches, inflatable boats, submarines and underwater craft.

An independent reconnaissance company (part of fleet Marine reinforcements) is used for reconnaissance of the amphibious assault landing area (on land beyond the waterline), helicopter and paratroop landing zones (deep in the enemy defenses) and also for conducting deep reconnaissance. Its personnel set up surveillance and warning instruments, conduct reconnaissance of coastal areas, roads, routes for the advance of the assault landing forces and overflights of helicopters and aircraft to the paratroop landing zones and provide navigation support for these overflights. There are about 160 men in a company (including 14 officers) and they are organized into 8 platoons: a HQ platoon, 6 reconnaissance platoons and a supply and service platoon.

Reconnaissance platoons are divided into amphibious reconnaissance, parachute reconnaissance and parachute diversionary platoons. A reconnaissance platoon consists of three four-man teams, one of whom is a radio operator. Landing in the enemy's rear area is done by underwater, surface or airborne methods. A company has 220 parachutes and 30 sets of UDT equipment and also inflatable boats. For operations in the rear, groups are formed which usually consist of 6 men, sometimes 12 or more. They perform their missions secretly and engage the enemy only if detected or upon command instructions to divert enemy forces.

Radio battalion subunits (part of the fleet Marine reinforcements) are used to conduct radio reconnaissance, electronic reconnaissance and EW primarily for the purpose of neutralizing enemy command and control and communications in the area of the assault landing operation and also to detect the approach of his reserves.

A reconnaissance battalion of a Marine division consists of five companies: a HQ and service company and four reconnaissance companies. A reconnaissance company includes a HQ and three platoons, each of which is broken down into four-man teams. One of the platoons has a team of underwater swimmers and the remaining personnel are trained to make beach landings by swimming and on inflatable boats. Reconnaissance patrols are formed from the teams and the number of them depend on the number, scope and complexity of missions, the time allotted to perform them and the geography of the assault landing area. A patrol is usually given one mission in a specified limited area. To perform various missions, especially when they require special equipment, several patrols may be assigned even within the same area. A patrol usually includes 6 people, but there may be 4 and in certain cases 12 or more. It conducts close reconnaissance in the enemy's rear area within the firing range of ship artillery and with the deployment on shore of artillery subunits of the assault landing forces--within range of the 105-mm guns.

A surveillance and warning platoon is part of the HQ company of the division HQ battalion and is intended for conducting surveillance using surveillance and warning (SW) devices. It has 2 officers and 44 NCO's and privates. Organizationally, a platoon has three 12-man squads, each of which is broken down into three 4-man teams. As foreign press reports, a platoon has 1,022 seismic, acoustic, magnetic and infra-red (IR) SW devices, 40 signal receivers and 20 recording instruments (recorders). For support of combat operations of an expeditionary division they use a surveillance system using BASS surveillance and warning device. Its central post is placed in a container which can be moved by any type of transport. A platoon has three sets of such a system. It is planned in the near future to equip it with the new AN/USQ-30 Forward Pass surveillance system whose SW devices make it possible to store detection data for several days in a memory unit and later transmit it to a reconnaissance aircraft flying over at its radio command. In 1985 it is planned to outfit the platoon with the REMBASS surveillance system which includes 859 SW devices, 16 portable and 9 transportable signal receivers and repeaters.

A target detection and surveillance platoon is included in the HQ company of each battalion and has over 30 men (including 1 officer). A platoon has four sections--HQ, radar, night surveillance and reconnaissance. The radar section (17 men) is divided into 8 two-man radar teams and each team is equipped with 1 AN/PPS-15 battlefield radar. There are four men in a night surveillance section equipped with transportable AN/TVS-4 night vision instruments. A reconnaissance section has eight scouts, most of whom are snipers and use night-vision sights. In the near future, the AN/PPS-15 radar set is scheduled to be replaced by the LBSD back-pack radar and the platoon is to be equipped with Folpen BSD transportable radars, enabling it to conduct surveillance through foliage, IR glasses and transportable AN/PAQ-7 target illuminator searchlights with IR filters.

The reconnaissance and observer air squadron (part of a Marine air wing) accomplishes surveillance and direct visual, radar and photo reconnaissance from low altitudes for the combat subunits of the division and also fire adjustment for artillery regiment subunits, target designation for strike forces and weapons, and vectoring of aircraft to strike targets. A squadron

has 12-18 OV-10A Bronco aircraft and 10-12 UH-1E Iroquois helicopters. The airplanes conduct reconnaissance at a distance of up to 185 km from their basing location and the helicopters--up to 95 km.

A Marine air wing photo reconnaissance flight accomplishes documentary aerial reconnaissance using aerial cameras, IR stations and side-looking radar. It comprises 10 RF-4B Phantom-2 aircraft equipped with KS-87, KA-56 and KA-82 aerial cameras, an AN/AAS-18 IR station and an AN/APQ-102 side-looking radar. When using surveillance and warning instruments, pods are mounted on the aircraft containing Minibar equipment which receives signals and relays them to a receiving post of the SW platoon located on the ship of the assault landing formation prior to the landing and on shore after the landing.

The EW flight of a Marine air wing is designed for electronic reconnaissance and suppression of the enemy's air defense electronic equipment for strike aviation. It includes up to 10 EA-6B Prowler aircraft.

In addition to special reconnaissance helicopters, visual reconnaissance is conducted by AH-1T/J Sea Cobra gunship helicopters and light UH-1N Iroquois transport helicopters. Other Marine aviation helicopters and aircraft can perform certain missions as well.

Foreign press describes the following sequence of conducting reconnaissance in an assault landing operation. Depending on the scale of the operation and the nature of enemy anti-assault-landing and air defenses, 10-15 days before the landing RF-4B Phantom-2 and EA-6B Prowler aircraft begin the reconnaissance. They operate from forward bases located no more than 560 km from the landing area or from aircraft carriers maneuvering at somewhat lesser distances. The mission of the reconnaissance is to disclose information about the enemy in the assault landing area: numerical strength of forces which may be involved in defense of the coastline, the presence and nature of anti-assault-landing and other fortified structures. It is also its mission to obtain aerial photographs of the landing areas, including lines of communication, bridges, helicopter and paratroop landing zones, paths of approach and withdrawal and other objects.

Groups of scouts and underwater demolition men are brought to the landing operation area 3-4 days before the landing and secretly landed. They begin reconnaissance of the area of the immediate landing. They measure the depths and determine the nature of the bottom and the current, the location of natural obstacles and artificial barriers in the water and on shore, the length and width of the beaches, their slope, the composition and density of the ground, exits from the beaches, possible areas of dispersion and storage, hazardous sections of the terrain, coastal landmarks visible from the sea and suitable traffic routes. In addition, they identify the location of anti-assault-landing fortifications, missile and artillery positions and the disposition of anti-assault-landing defense forces and their reserves, headquarters, command posts and main communications centers.

After completing their mission, the reconnaissance groups evacuate the area, but part of them (groups of the independent reconnaissance company) may remain to continue reconnaissance deep in the defenses. In the most important areas,

surveillance and warning equipment is set up for the purpose of timely detection of regrouping of enemy forces.

In the final hours before the start of the operation (in the hours of darkness), reconnaissance parties from the independent reconnaissance company may be sent to the flanks of the landing area and to the rear of the defenses, but the reconnaissance parties which remained on the beaches concentrate at earlier designated safe areas and withdraw from the landing area to its flanks or deep. Aerial reconnaissance is stepped up sharply during this period. The main mission of all reconnaissance forces at this time is to detect enemy reserves and quickly report on their movement to the assault landing area and also to support strikes against them by aircraft and ship artillery. In specific cases, prior to the start of the operation certain reconnaissance battalion subunits of the Marine division may be landed on the shore in addition in order for them to deploy in areas of which reconnaissance is of the most interest for command authorities. This landing is usually accomplished by small subunits by using helicopters, but individual subunits may reach shore on inflatable boats or by swimming on the surface or underwater.

With the start of the operation, as soon as the contours of the shore are visible, underwater demolition men are brought to the areas of previously detected underwater barriers which they blow up and mark those remaining with markers.

Subunits of the division reconnaissance battalion are usually landed in the first or unplanned waves of assault-landing vehicles at the flanks of the landing area or in the first waves of the helicopter assault and operate ahead of the Marines as a platoon or company. Light transports or helicopters are used to move them.

With the start of the assault landing, UH-1E/N Iroquois and AN-1T Sea Cobra helicopters and others, flying from aircraft-carrying landing ships, begin aerial reconnaissance missions. After the landing is completed and temporary airfields are built, OV-10A Bronco aircraft also conduct reconnaissance.

After consolidation of the landing force on shore, aircraft and helicopters may drop deep-reconnaissance parties in the enemy's rear area; their main mission is to identify the movement routes of enemy troops. A network of battlefield sensors are set up manually or from aircraft for surveillance coverage of all possible lines of march by enemy troops along roads which may not be covered by surveillance of scouts.

Small reconnaissance parties (4-6 men) usually travel as one group in the enemy's rear area and with larger groups (12 or more men), they break down into central, left and right flank security and covering forces (2 men in each with an automatic weapon and a VHF radio). The parties operate independently in their designated area, where aircraft and artillery strikes are prohibited.

For command and control of reconnaissance forces and processing of the information obtained by them, temporary intelligence agencies are established at various command levels and operate during specific phases of the operation. Thus, during the period from the start of reconnaissance planning until the

landing force commander assumes command on the beach, a joint intelligence center is organized. It is managed jointly and equally by the intelligence chiefs of the assault task force and of the landing forces. It is made up of intelligence specialists of the Navy, Marines, Marine Aviation and Naval Aviation who are responsible for matters of maritime, ground and aerial reconnaissance respectively. The center determines the overall reconnaissance missions in the operation, collects and processes the reports received, charts detected enemy maritime, ground and aerial targets, performs a continuous analysis and assessment of the situation, compiles a list of targets subject to destruction and develops schedules of reconnaissance missions. The intelligence center is disbanded when the landing force commander assumes command on shore.

After the joint intelligence center ceases its activities, an intelligence section is established under the HQ of the assault force commander. It includes administrative, an operational intelligence and a counter-intelligence branches and also an electronics intelligence and EW coordination center. The operational intelligence center branch consists of two sub-branches for collecting and processing materials. The first one includes sections for office work, collecting ground and maritime reconnaissance and surveillance data and collecting aerial reconnaissance and surveillance reports. They perform preliminary processing of information coming in from various sources. The section sub-branch consists of sections for recording (ground, maritime and aerial reconnaissance) and target reconnaissance which perform final processing, analysis and evaluation of materials received. The electronics intelligence and EW coordination center controls signals, electronics intelligence and EW forces. It includes intelligence and communications representatives of the Marine division HQ, electronic warfare specialists of the radio battalion and of the independent EW air squadron. The center is managed by the division's chief of EW service.

Other management elements of reconnaissance forces and equipment in an assault operation include the intelligence section of the Marine division and the reconnaissance branch of a Marine air wing.

The division intelligence section (headed by the division chief of intelligence) has three basic branches: battle reconnaissance, special intelligence and EW, counter-intelligence.

The battle reconnaissance branch includes four sections (operational, photo reconnaissance and aerial photo interpretation, target reconnaissance and ground surveillance), a prisoner interrogation and interpreter team and also a platoon of SW instruments. In order to increase mobility, the section is placed in three special containers which can be transported by motor vehicle, helicopter, airplane or ship. The communications center is located in one of the containers and in the others are equipment for processing and analyzing the information and materials received.

The reconnaissance branch of a Marine air wing (headed by the chief of intelligence of the air wing) consists of four sections, the most important of which is the combat aerial reconnaissance section. The latter is divided into the following specializations: reconnaissance of air defense facilities,

analysis of enemy aircraft battle formations, target reconnaissance, strike assessment, photo reconnaissance and aerial photo interpretation, electronic reconnaissance and EW and others. All data on the aerial situation and its changes is concentrated in the tactical aviation control center which prior to the landing of the assault force is located on one of the ships of the assault task force and is landed on shore following the troops.

Such is some of the information from foreign press concerning the reconnaissance forces and equipment in a "capture" type amphibious assault landing operation conducted by an expeditionary division, their organization and tactics of application.

12567
CSO: 1801/58

NAVY COMMAND CENTER INFORMATION DISPLAY SYSTEMS DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 84 (signed to press 7 Sep 84) pp 68-71

[Article by Captain 1st Rank (Reserve) A. Markov: "Information Display Units at U.S. Navy Command Centers"]

[Text] The U.S. Navy command authorities, in implementing the aggressive militaristic plans of the country's ruling circles, pay serious attention to increasing fleet combat readiness. Various exercises and maneuvers are conducted for this purpose. Command and control of fleet forces during peacetime and during crisis situations is accomplished from specially equipped command centers where information, varied in content, degree of summarization and other characteristics, necessary for situation assessment and decision making is collected, processed and displayed.

The large amount of data coming into the command centers and the need to report it on a real-time basis has given impetus to the wide use of automated information processing and display equipment. The basis of this equipment is electronic computers which accumulate information, select it according to a set program and transform it into a convenient form. According to American press reports, today a U.S. Navy command centers information is displayed by printing and drawing on paper and also by illumination on screens and boards for individual and collective use.

Printing devices (teletypes, telexes and line printers) are designed to depict alphanumeric information on paper.

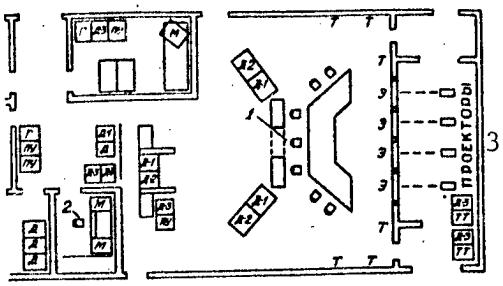
Teletypes operate at a speed of 10-25 characters per second, transmit information mainly directly over communications lines and also use them to receive it. Teletypes receive quite limited usage at command centers.

Lately, telexes are finding increasingly application for printed communications over telephone lines and for output of information from computers. They are high-speed terminals which operate at a speed of 90 or more characters per second. At command centers, telexes operate mainly in conjunction with displays and the size of their screens conform to the length of the telex lines (70 characters). This makes it possible to make documents of the information displayed on the screens only when needed. The telexes operate silently due to the needle-type printing heads.

Line printers (300-600 lines per minute) are designed for output of large files of information from computer data banks in the shortest possible times. Their operation is controlled by a computer.

Graphic plotters are used for automatic drawing of graphic information. Information formed with the aid of the display is fed to their control unit. As reported in foreign press, primarily electromechanical plotting-board type plotters with a field 1.2 X 1.8 meters, having multicolored writing attachments and with an operating speed of not over 150 mm per second are being used at command centers today.

The visual display is the most important means of depicting data for individual use. It makes it possible to input data to the screen manually by means of a keyboard which, in addition to printing letters, figures and certain special characters, gives commands to output information from the computer data bank through a buffer memory unit to the screen. Information can be arranged and, if necessary, repositioned to any point on the screen. The keyboard can be used to correct and add information and also to send it by destination to documentation or collective display equipment, for storage in the computer's memory and so forth.



Layout diagram of display units at a fleet command center

Key:

1. Position of the commander-in-chief of the fleet
2. Position of command center operations duty officer
3. Projectors
Э Collective-use wall display screen
Т Illuminated indicator board
М Display monitor
Д Engineering display
Д-1 Functional automated control system display
Д-2 Integrated Information Display System display
Д-3 Textual reports subsystem display
ПУ Printer
Г Graphic plotter
ТТ Teletype

Today, the most widely used displays are the television-type with a cathode-ray tube screen. They may be alphanumeric or graphic (against a background of a map or terrain plan). The operator can analyze the information in the

computer's memory, prepare the necessary reports and produce data for the collective-use screens and display boards. According to Navy command representatives, the displays ensure high reliability, speed and convenience in work, but are relatively expensive and complex to manufacture.

Collective-use information displays (large screens or display boards) are designed to present output data from automated systems to the command authority managing the forces from a given command center as well as to his staff officers. On these screens, as a rule having considerable dimensions, the situation is illuminated in the form of symbols against a background of a geographical map. At shore command centers of the fleets and U.S. Navy HQ the wall screens measure 2 X 2 meters and at tactical flagship control centers--1.5 X 1.5 meters. Shore command centers and flagship control centers use projection screens and a special film is used as the projector transparency on which the image is recorded by a laser beam.

Wall display boards, as a rule, display formalized information containing assessment or reference data in a strictly defined format or in tabular form. These display boards use as indicators elements which can vary their brightness depending on the voltage applied--light-emitting diodes, liquid crystals and electroluminescent elements. Light-valve display boards are used for displaying urgent information coming in directly over telegraph lines in random form.

Special command and control automation equipment has been developed for tactical flagship control centers, including the modular AN/UYQ-21 display system which includes displays, large wall screens, automated display boards and devices for automatic extraction of data from documents. An experimental batch of 17 models are now being manufactured (one of them has been undergoing tests on the aircraft carrier America since 1983). In the process of trial operations the replacement and modification of individual modules is envisioned. According to American command authorities, the AN/UYQ-21 system is expected to be used through 1990 in practically all tactical command and control systems of the Navy.

In a shore fleet command center today there are 4 large collective-use wall screens installed, a considerable number of light display boards, at least 15 displays as well as graphic plotters and various printers (see figure). They display information contained in the data banks of autonomous command and control systems: operational and general situation, intelligence, ASW forces, weather conditions and other information.* As foreign sources report, each system has its own specific characteristics which does not permit using one type of computer in them very effectively. Functional automated control systems were developed based on the technical equipment and software which was most suitable for them. As a result, at present each automated control system performs only its part of the overall tasks of the fleet command center.

In May 1978, the Navy command authorities decided to improve the fleet command center automated equipment, part of which had not yet been operationally

*For more details on Navy automated control systems see: ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1983, No 9, pp 67-71.

tested. The objective was to explore the possibilities of integrating information contained in the various systems. By early 1981, recommendations were prepared and approved for development of the Integrated Information Display System (IIDS). One of the basic requirements placed on it was to make maximum use of already existing technical equipment and communications systems. In developing the new system, the software and computers of the OSIS ocean surveillance information system were taken as the basis as most closely approximating its functions. An experimental model is presently being tested at the Pacific Fleet Command Center, after which it is expected that other command centers of the higher command and control echelon of the Navy will also be equipped with these systems.

As foreign press reports, the main functions of the IIDS include: joint operation of fleet command center automated systems under normal conditions and in crisis situations; collection, processing, joint storage and display of information on the location of one's own forces and those of the enemy and neutral countries; transmission and display of the situation integrated in time and place at higher and tactical level control posts; storing and displaying information on the combat readiness status of one's own forces.

The IIDS consists of three subsystems: collection of automatically compiled messages, processing of textual reports and distribution and display of information.

The first subsystem receives and processes messages created by computers of information sources. In this case they are computer data banks of the fleet command centers' automated systems and automated equipment and sensors of shore HQ and command centers, ships and aircraft which support operation of the IIDS system on a real-time basis.

Its main tasks is to ensure electrical and informational interfacing of information sources with technical equipment of the system by using compatible communications lines and interfaces. Appropriate devices have been developed for each automated control system which decode the messages and transform them into a form suitable for processing in the IIDS. In addition, the susbsystem automatically monitors the correspondence of the languages of the message and the system, uses a special signal to notify the operator of the receipt of especially important messages and processes outgoing messages so that they meet the criteria of the automated control systems of the users. All messages passing through it are recorded on perforated tape for monitoring and subsequent use.

The textual report subsystem collects non-formatted messages and converts them into a form suitable for computer input and also forms outgoing messages. Using two teletypes, the operators of the information collection positions request and receive messages over direct communications lines and over common lines in accordance with the addressing. In addition, at the direction of the duty officer, the position operators supporting the operation of the subsystem select necessary information from reports, summaries and other documents received at the fleet command center.

The textual reports subsystem is equipped with technical equipment, primary of which is the processor which ensures the assembly and storage of messages prior to their transmission to the data banks of the system's main computer or to external subscribers. Six displays are connected to the computer. Two are designed to input information received over the telegraph communications line and the rest are installed at the main positions of the command center. Using the displays, the operators build messages in the proper format, correct them or add to them and then upon command transmit them according to the designated purpose. The processor has a direct output to the systems main computer which gives a confirmation for each message received or points out errors in it. Data is transmitted to external subscribers via the subsystem of automatically compiled messages where it is first recoded by the interface devices of the corresponding control systems.

The distribution and display subsystem analyzes and corrects information. It is the main subsystem in the IIDS. Its key component is the YAX-11/780 computer which assembles and prepares the converted information for display on one screen. All the information is distributed into three parts of the data bank: positions of one's own forces, allied forces and the probable enemy (information about the time, object, its location, course, speed, etc.); technical characteristics of the objects command authorities are interested at that time, their weapons and observation facilities; the combat readiness status of one's own forces.

Each part of the data bank is recorded using an independent memory--two on disks and one on magnetic tape.

Four automated user positions are connected to the system's computer and are installed at the following stations: operational and overall situation, ASW forces and IIDS system control. All are capable of operating simultaneously. Furthermore, each operator has the capability of independently calling up the information required, making changes to it, passing it to display equipment and creating new data. Distribution of the user positions to the various stations provides for their use only in its direction and using them for forming a situation for which that stations is responsible.

The IIDS system control station coordinates the operation of the rest of the stations and upon request forms a situation in individual geographic regions for a specific moment or period of time. It is charged with all calculating tasks, including determining the characteristics of target movements, optimum courses and speeds of objects, distances and time of arrival at a specified point. Based on information contained in the data bank, correlation and comparison charts of the status of objects and groupings are made up. If command authorities are interested in a specific area, then the fighting capabilities of the forces for carrying out the general or specific tasks facing them and the probable losses are continually calculated according to incoming reports on changes in combat readiness of the forces and also according to existing information in the data bank. In addition, the control station builds messages containing command orders and instructions which concern all or most of the subordinate forces.

The IIDS system makes it possible to correct information in the bank based on new data automatically, that is, without operator participation. Information which, for some reason or other, is not accepted by the computer is printed out for the operator. At the system's user position a screen displays graphic or alphanumeric information (or both together) in the form of graphs, tables, texts and charts. The computer's program makes it possible to depict the situation against a background of a terrain plan and maps in gnomonic, Mercator and stereographic projections.

Foreign specialists believe that the integration of information from various systems into a single system and its combined display on one screen enables the command authorities of the American Navy to increase the quality of situation assessment by drawing on the greatest number of components which characterize it. This is especially important, they emphasize, under today's conditions since the U.S. Navy is operating in various regions of the globe (the Persian Gulf, the Indian Ocean, the Mediterranean Sea, off the coast of Central America and so forth) which requires a rapid assessment of the overall military and military-political situation and timely shifting of fleet forces from one region to another.

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CSO: 1801/58

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Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 1-2

[Text] GENERAL MILITARY PROBLEMS

GROUND FORCES

AIR FORCES

NAVAL FORCES

10272
CSO: 1801/387

REAGAN ADMINISTRATION MILITARY STRATEGY CRITICIZED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 3-9

[Article by Doctor of Philosophical Sciences, Professor, Lt Gen D. Volkogonov: "The Strategy of Adventurism"]

[Text] Recently overseas more and more one hears not only the beating of the military drum and the tread of soldiers' boots, but also speeches abundantly embellished with peace-loving rhetoric. Thus, in speaking on 4 March 1984 at the annual conference of the National Conservative Political Action Committee, the American President stated that "America should become a symbol of peace throughout the world." He was persuading his listeners that this was the "highest aim" of the Western, capitalist states. Certainly such appeals could be welcomed if they were backed up with concrete deeds. As was emphasized by the General Secretary of the CPSU Central Committee, the Chairman of the Presidium of the USSR Supreme Soviet, K. U. Chernenko, such assertions about peaceful intentions "could be taken seriously only in the event that they are reinforced with real actions." But so far there have been none.

An analysis of the policy of the American Administration and the U.S. Military Department indicates that the former militaristic course of achieving military supremacy over the USSR has remained unchanged. Ideological costmetics contained in the speeches of R. Reagan and other American politicians and military leaders has been caused by pre-election considerations and the desire to confuse the people about their true intentions. As before, these are based upon aggressive strategic views and are realized in the concrete broad military preparations conducted by the United States and the other NATO countries.

The Chimeras of "Direct Confrontation." As is known, as early as 1981, the current American Administration adopted a strategy of "direct confrontation." Its essence was set out by the military experts W. Schneider and R. Stillwell in the report "Strategic Guidelines" approved by the president. In this report the entire world is presented as an object of U.S. strategy and in the opinion of the authors, the United States is capable of achieving its political aims by demonstrating military might even to the point of being ready to use it without restraint. For achieving what it desires the Pentagon has set out the long-term goal of achieving a significant military superiority over the Soviet Union. The analysis "The Choice of Strategy for World War III" prepared by the Pentagon employee T. Powers asserts that constant readiness for "direct confrontation"

with the USSR, in being ahead in the crucial components of military might, can force it "to be more compliant."

These, like certain other strategic views of Washington, were transposed to the score of specific military programs and plans. The basic ideas characterizing the American strategy of so-called "direct confrontation" were set out in the "Directive Instructions in the Area of Military Development for 1984-1988."

The political aspects of the strategy. The document starts with the formulating of the global aim of the United States: to be ready in the event of conflict to "destroy socialism as a sociopolitical system." Nothing more, nothing less than the "entire system." Here the preamble sets the specific task of working out plans for being the first to employ nuclear forces in the theaters of war. Even these brief excerpts from the "Directive Instructions" are sufficient to judge them as an extremely dangerous expression of the strategic views of the American military which think primarily in the categories of nuclear war. The new strategy views U.S. security exclusively through the prism of the complete absence of such security for the USSR.

The strategy quite definitely states that the main aim of the organizational development of the U.S. Armed Forces over the immediate 5 years is to achieve "lasting" one-sided military advantages over socialism. The entire 136-page document is permeated with the idea of so preparing for a nuclear war that the United States would be capable of "getting the upper hand in it." Here as before the emphasis is on being the first to make the nuclear strikes.

It is obvious to everyone how dangerous these plans are. However, the politicians from the White House and the men in the generals' uniforms from the banks of the Potomac do not consider many factors. In the first place, no dangerous U.S. challenge can remain without a proper response. Secondly, it is impossible at present to ignore the growing public opinion of millions of people on all continents who do not want to accept the real possibility of turning our planet into an asphalt desert.

The military-technical aspects of the strategy determine the nature and methods of utilizing the notorious strategic "triad" of the United States. As is known, the American strategic offensive forces (in the United States they are eloquently termed "offensive") consist of three components: the intercontinental ballistic missiles, nuclear submarines with ballistic missiles and strategic bombers. There is every reason to assume that the Pentagon is presently preparing to add to these three elements another two: the medium-range nuclear missiles in Europe and weapons which can be deployed in space. Such aspirations express the plans for globalizing the strategic goals of the American military who are attempting to militarize the land, the oceans, air and space.

The military-technical aspects of the "direct confrontation" strategy speak very eloquently of the increased military preparations of the Pentagon. The document confirms that for carrying out militaristic plans, fantastic amounts are being allocated: around 2 trillion dollars for the years of 1984-1988. In order to blunt the concern of simple people, low-test political demagoguery is being put to work. For example, the Secretary of the Navy J. Lehman in front of a TV camera persuaded the viewers (and obviously the 11 million unemployed) that

"each billion dollars which we spend creates or provides 40,000 jobs." Precisely the military-industrial complex operates as the leading generator of the monsterous arms race. For it, certainly, military business means profits, super-profits and extra-profits. Billions upon billions of dollars are thrown upon the altar of the arms race, increasing the risk of nuclear war.

In accord with the "Directive Instructions" the Pentagon over the next few years will have operational a new generation of MX missiles, it will develop yet another strategic mobile missile of the "Minuteman" type and begin producing the B-1B supersonic strategic bomber and will continue development under the Stealth Program of a fundamentally new strategic bomber. It will broaden production of the air-launched cruise missiles, as before it will build giant nuclear missile submarines of the "Ohio" type armed with the Trident system (four such boats have already been commissioned in the Navy and six are under construction) and will make operational many new military systems and objects. However, we might ask why has the United States sharply increased the curve of military preparations and has it really achieved military supremacy? Has its security actually increased? No. The realization of all these programs merely intensifies the danger of nuclear war.

An externally paradoxical situation has arisen: the military capabilities of Washington are growing but its ability to achieve political aims by military violence has not increased. However, the overall "threshold of security" has dropped. And in the recklessness of the present American policy, the creators of military strategy can more easily step over this. All of this represents an unprecedented danger for the states of all the world and for all mankind. Peace has been preserved only because real socialism sees in this one of its main tasks and fights for it. Only the presence of restraining might and the capacity to make a retaliatory strike under any conditions check the potential aggressor.

Thus, the "direct confrontation" strategy reflects primarily the increased aggressiveness of Washington and a globalization of its claims to supremacy as well as the increased capacity to conduct an extended nuclear war. Actually a process is occurring of broad preparations for war and this can lead to the death of human civilization. Adventurism, class malice and fear of the future have obscured the reason of those who stand at the helm of the NATO ship.

An example of such adventuristic actions is the plans announced by the American president a year ago. According to him the United States, in continuing to increase its strategic forces, has commenced extensive work in the area of space antimissile defense systems. Contrary to the existing bilateral agreements with the Soviet Union, in particular that of 1972, Washington intends to tighten the spiral of the arms race even further and make peace even more fragile and unstable. As always (one has merely to recall the statements over the development of new types of chemical weapons, space systems, neutron bombs and so forth), this new step in militarizing life in the world has been demagogically called by the American president a decision "providing new hope for our children in the 21st Century." According to his logic, peace can be preserved only by continuously arming, by developing new nightmarishly-expensive systems and inventing apocalyptic means of destroying all life on the planet. The aggressive nature of thinking is not merely an historical anomaly. This is an

expression of the profound, spiritual crisis in the world which continues to call itself "free!"

But all hopes to achieve unilateral military advantages are non-starters. The Pentagon's "Strategic Guidelines" are the marks of chimeras. History provides much evidence that the Soviet Union possesses sufficient capabilities to respond properly to any challenge threatening our security. We will not permit anyone to disrupt the parity or shatter the balance, as the Soviet political leadership has repeatedly stated.

"Limited War" and Western Europe. In accord with the "direct confrontation" strategy, Washington feels that a war between the United States and the USSR, NATO and the Warsaw Pact can be all-out and limited and this is conceived of as being waged employing both nuclear weapons and just conventional ones. In the opinion of the Pentagon planners, a "limited" nuclear war in a theater of war (particularly the European one) would be most to the liking of the United States. It is no accident that the model and scenario for such a conflict have been repeatedly worked through and played through in exercises and headquarters games in the bunkers of the NATO strategists. What is the essence of the concept of a "limited" nuclear war as put forward by American politicians and military figures? For this, let us examine the balance of nuclear forces in Europe.

As is known, at present, the USSR and NATO have approximately 1,000 nuclear carriers each in Europe. For this reason, as is usually said, there is an approximate balance of medium-range nuclear forces and means. Although, if one breaks down into detail the existing ratio into the total number of nuclear charges for these carriers, NATO has almost a 1.5-fold superiority in comparison with the USSR. Naturally, the 1,000 NATO carriers includes the 119 English missiles and bombers and the 144 analogous systems of France. These so-called "independent" national means are continuously being improved. For example, in Great Britain the submarines are being armed with advanced Polaris-A3 missiles with six warheads each. In the not distant future they plan to deploy on them the new sea-based Trident-2 ballistic missiles with 14 warheads each and a greater range than the Polaris. Preparations are also underway in France to replace the single warheads on the missiles with multiple warheads carrying six nuclear charges. At the same time, France is building another nuclear missile submarine in addition to the five already in service. Thus, these forces which the NATO members have endeavored to exclude from the real balance in and of themselves are an impressive arsenal.

But the basic share of the medium-range nuclear weapons is made up of American systems. These are constantly being improved and modernized as the U.S. forward-based forces in Europe. Over the last 18 months a significant portion of these warheads was replaced with newer, more advanced ones. At present, there is information that the Pentagon, contrary to the promises given to pacify public opinion, is preparing to bring in and deploy at bases in Western Europe also the neutron weapons which are a barbarian weapon of atomic genocide. Even now the saturation of the FRG territory with nuclear weapons is the highest in the world. Western Germany is storing enormous quantities of American toxins and will not deploy, as the Western journalists say, the medium-range "murder missiles."

As we can see, the NATO nuclear arsenal in Europe is more than impressive and is aimed against the Soviet Union. But this is not enough for the Pentagon. In accord with its doctrinal views and in endeavoring to shatter the existing balance in medium-range weapons, the United States is continuing to deploy almost 600 American Pershing-2 missiles and ground-launched cruise missiles. When all of these are in place, the advantage in terms of the carriers of nuclear weapons will then shift toward NATO with a ratio of 1.5:1 and for warheads 2:1. Precisely this--superiority--is what the United States and its allies are seeking.

But it is not only a question of the quantity of nuclear weapons. It must also be considered that all these medium-range missiles are strategic ones in relation to the Soviet Union. All of them are first-strike weapons representing an enormous danger for the socialist countries. C. Gray, one of the advisors of the American president, in his study "Victory is Possible," in the scenarios of future wars has given a special place to the European medium-range missiles. Their role will consist, as the author puts it, in "decapitation," that is, destroying the vitally important centers and lines of communications of the Soviet Union. In counting on these missiles as a first-strike weapon, American experts proceed from the fact that the flight time of the Pershing-2 missiles to targets in the Soviet Union is just 5-6 minutes. The Pentagon assumes that in the event of a nuclear conflict which the United States is preparing to initiate, the Soviet Union will be forced to use a significant portion of its arsenal against the NATO nuclear weapons in Europe, and this will substantially reduce the number of carriers which should "reply" to the United States itself. Thus, according to the plans of the Pentagon leaders, a future nuclear war can be limited to the confines of Europe while the United States will avoid crushing retaliatory strikes. This is the cynical essence of the concept of a "limited" nuclear war which is aimed at removing the United States from the threat of retribution. This also is the not too secret purpose of deploying the American "euromissiles."

These plans of the Pentagon express a profound desire on the part of the American military to make Europe the epicenter of the nuclear conflict and cataclysm. C. Weingerger and his supporters are little concerned by the fact that in the given instance Western Europe will actually be turned into America's nuclear hostage, as it were deflecting to itself those strikes which could reach the United States. Precisely this explains the fanatic, maniacal obsessive idea of Washington to deploy the American missiles in Europe at any price. For now the figure is 572, but later on possibly there will be even more. In the event of a war, Europe in essence will be slaughtered for the sake of the notorious U.S. "vital interests." Actually the Pentagon proceeds from the principle that the more American missiles in Western Europe, the greater the security achieved for America. And they want to achieve this with the aid of the idea of a "limited" nuclear war.

At present, a new aspect is being added to this. The Pentagon intends to complicate the missile situation in Europe by its "space Odysseys." Using, as always, demagogic methods, the American president in one of his speeches announced that he decided to move to create an "antimissile shield" for the United States. In essence, the given announcement means that American imperialism in addition to the "nuclear shield," intends to arm itself with an "antimissile space

umbrella." This step is not accidental. The problem is that the decision to establish a "miracle defense" coincides in time with the deployment of the several hundred Pershings and cruise missiles in Western Europe. The strategists in the Pentagon feel that with the deployment of the missiles and the creation of an antimissile defense system in the 1990's, a very favorable situation will develop in the future for the United States. The line of their reasoning is approximately as follows: the Pershing-2 missiles can reach the USSR in a very short time while a retaliatory strike against the aggressor in the United States would require several-fold more time and to a significant degree would be "neutralized" by the AMD [antimissile defense] system deployed in space.

In endeavoring to turn Europe into the epicenter of a nuclear clash, the Pentagon strategists in their plan see the future space AMD system as that previously missing element of "ensuring victory." If, let us assume, the United States succeeded in developing such a system and it could protect itself relatively securely against retaliatory strikes, the American aggressors would have an opportunity to choose a particularly convenient moment for a preventive strike. For this reason, the space AMD system is not a defensive element but rather a strictly offensive, aggressive one. For this reason the Pentagon's space concepts cannot be examined in isolation, outside the context of its general strategy of "direct confrontation" which presupposes the admissibility of a nuclear war and the possibility for the United States to "gain the upper hand in it," but also outside the European "missile" plans. These illusions of the American strategists are exceptionally adventuristic. Clothed in the form of operational plans, they actually increase the risk of nuclear cataclysm in which the aggressor, if it decided upon the senseless step, would undoubtedly be annihilated.

The idea of achieving victory in a nuclear war and the admissibility of a "limited" nuclear war in Europe is extremely dangerous for the cause of peace. But the Pentagon is planning on this. The leaders of the U.S. Military Department continue to draw up their "scenarios" and "models" of a nuclear war and according to these they are planning to make a so-called "first disarming nuclear strike." The strategists from the Pentagon have an obsessive idea that if they have two- or three-fold more nuclear weapons than the USSR they thereby will gain the right to impose their own conditions on the USSR, threatening it with the possibility of winning a military victory over it.

However, it is clear that the stockpiling of weapons above a certain limit ceases to be of obvious military importance since life on the European continent, like in the world as a whole, can be destroyed only once and not twice or thrice. If the aggressor endeavors to destroy the enemy with the aid of nuclear weapons, then obviously it also is defenseless before a retaliatory strike. Thus, security consists in something else: in the ability to prevent a nuclear cataclysm and to erect secure barricades on the path of the arms race.

Nevertheless, the present militant actual actions of the American state leaders show something else. The U.S. military budget is continuing to grow: this year, around 300 billion dollars have been thrown into the furnace of the arms race. In essence, this budget at present is like a tall spire rising above the flat plain of social programs and reminding people of the serious military danger which derives from the United States. The American military is continuing to

branish its weapons creating new military bases, training "rapid deployment forces" at full speed and conducting exercises for the strategic triad.

All this militaristic sounding of the alarm, the ever-new NATO decisions on the need to develop even more advanced missiles, submarines, super-modern bombers, space weapons and cruise missiles are concealed behind the ideological camouflage of false statements about the notorious "Soviet military threat." Precisely this, this mythical "threat" is the main argument of the military from the Pentagon and NATO in justifying their dangerous policy of nuclear confrontation. During a press conference in February 1984, the U.S. Secretary of Defense again mentioned the "aggressiveness of the Soviet" and their "military superiority." One cannot help but recall the exceptionally apt comment of V. I. Lenin addressed to those who shout about "Red militarism." He said that they are simply "political swindlers who pretend that they believe this rubbish" ("Complete Collected Works," Vol 38, p 50). It is dangerous when the "political swindlers" not merely talk rubbish but also control an enormous military machine. And it continues working, poisoning the international atmosphere and increasing the risk of nuclear war.

The Sole Reasonable Alternative. "The difficulty of the situation," emphasized Comrade K. U. Chernenko, "obliges us to double and treble our efforts in carrying out a policy of peace and international collaboration." Confronted with the growing military threat from the overseas "crusaders," mankind is becoming evermore clearly aware of an irrefutable truth: the hopes placed on the future can be realized only under conditions of peace. In the last quarter of the 20th Century, peace, as a state of society which rejects war, becomes the main condition for the further existence and development of human civilization. However, the shadow of the nuclear threat behind which stand the United States and NATO is becoming ever-darker. Under these conditions millions of people are doing a great deal to prevent the worst possible thing, a nuclear catastrophe. At present, there is one important objective basis for this which, if it is actually realized, could create sound prerequisites for the preserving and strengthening of peace. What do we have in mind?

The Soviet political leadership has repeatedly stated that at present peace can be ensured only on the basis of observing the principle of equal security for all states. The desire to achieve unilateral security, as the United States is doing, at the expense of the complete absence of such security for the USSR and its allies can only increase the risk of a terrible war. At present, a military-political situation has objectively come into being where parity, balance and equality of strategic and conventional weapons between the two opposing blocs can ensure a state of peace in our world. "The existing military-strategic equilibrium between the USSR and the United States, between the Warsaw Pact and NATO," as was emphasized at the 26th CPSU Congress, "objectively serves to maintain peace in our world." Supremacy multiplied by the evil will of the adventurers who are seeking hegemony makes the structure of peace very shaky. Incidentally, in history there are examples of rather extended periods of equilibrium. For example, after the Napoleonic wars in Europe up to 1914, an unique balance of opposing forces made up of many states and alliances was observed.

At present with the enormous interdependence and interlinking of the modern world, any attempt to disrupt the equilibrium can lead to an irreparable catastrophe. Unfortunately, those on the hill of power in Washington cannot understand this. The military-strategic equilibrium, thus, operates as the determining material dominant on the basis of which one could begin the next step, that is, talks for a balanced, proportional, even and gradual reduction in the weapons levels of the two sides.

However, the content of American policy and all the concrete actions of Washington, regardless of the peace-loving rhetoric of recent times, is aimed at shattering, disrupting and abruptly shaking the formed and presently existing military-strategic balance of Soviet and American forces. This is tantamount to undermining a portion of the foundation of the edifice of peace. It would not merely sway but could also collapse, burying millions of people and, incidentally, the initiators of this monstrous action. Yet it seems like this is what the politicians from the White House intend to do. The American line remains as before, that is, to provide a significant military advantage over the USSR by deploying the new American missiles in Europe. The upsetting of the equilibrium in Europe will disrupt the world military-strategic balance and consequently will sharply increase the threat of a direct military confrontation, since American imperialism is making a monstrous wager on the possibility of resolving the basic contradiction of our age by nuclear means.

The Pentagon has already begun to say that after the Americans deploy the 572 units of Pershings and cruise missiles in Europe, they will not rest with this. Beyond any doubt, the American politicians and generals, in following the militaristic logic, will demand a further stuffing of the Old World with chemical weapons, shifting here both neutron weapons and constantly new missiles. Certainly their strategic plan has long been clear: the more weapons in Europe, the more Soviet nuclear systems they will attract and in the event of war the United States again can remain on the sideline of the all-incinerating Apocalypse. But these hopes are in vain.

The basis of security for Europeans as well as for the peoples living outside this continent at present consists in a struggle to maintain the military-strategic parity. But precisely the United States which in December 1983 began to deploy the new missiles in the FRG, Great Britain and Italy intends to sharply tip the scales of the strategic balance in its favor. To the accompaniment of "peace-loving" talks in the course of the "pre-election race" in the United States there has been a further strengthening of the Pentagon's military muscle. American missiles continue to be deployed in Western Europe. The work of militarizing space and developing highly accurate weapons which are as effective as nuclear ones is growing wider. Recently the United States noticeably increased the number of major maneuvers having an overtly provocative nature. Particularly dangerous were the exercises of the strategic offensive forces. For example, the Strategic Exercise Global Shield-83 encompassed the territory of the United States, Canada, all of Western Europe, the Pacific Zone, the Indian Ocean, Australia and Oceania. During such exercises all elements of the triad aimed at real objects in our country are brought to full combat readiness. It is not hard to see what enormous danger these actions of the U.S. military are in "silently" bringing the world to the very threshold of nuclear conflict.

All of this in the language of the Washington politicians is called "ensuring peace." Precisely this was how U.S. military policy was described by the American president, in answering the questions of TIME magazine on 2 January 1984. "I want to bring the world to the path to peace," the head of the Washington Administration reasoned pompously. But what about his other numerous statements of the "evil empire," "the readiness to employ force for the sake of the ideals of freedom" and that "it is impossible to reach agreement with the communists" and so forth? Are not the peaceable arguments of the president merely tribute to the pre-election tactics but also a forced (although concealed) recognition of the collapse of his policy of force? In any event, in extending the olive branch with one hand, the president with the other signs constantly new decrees, orders and instructions in accord with the notorious "direct confrontation" strategy, the strategy of adventurism and irrationality.

Under these conditions, the determination and decisiveness, consistency and successiveness of Soviet policy on the question of defending peace operate as a crucial factor in restraining the forces of war and aggression. In response to the absurd, adventuristic policy of Washington, the USSR is taking the necessary measures to protect its security and that of its allies. These measures have been forced on us. They must prevent a disruption of the military-strategic equilibrium between the Warsaw Pact and NATO in Europe.

If one examines the essence of Soviet policy on the questions of preserving peace in the world, it is exceptionally clear and definite: the security of all on the basis of a parity and strategic eqilibrium of the two systems. The immediate goal of the USSR, as follows from the statements of its leaders, is to set back the immediate threat of a nuclear war and then to further reduce its probability and ideally to exclude the possibility of its outbreak in the world. However, in Washington they view foreign policy as a phenomenon where one side wins while the other inevitably loses. It is time for them to realize that such a position can lead only to a general, global loss for everyone, that is, to a war, and there must be a general winner, peace. Only on the basis of a military-strategic balance, equality and parity can peace be guaranteed today. The future depends upon the ability of real socialism to maintain this strategic parity and keep the highest vigilance and combat readiness.

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SOVIET VIEW OF THE FALKLAND CRISIS GIVEN

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 9-17

[Article by Capt 2d Rank Yu. Marov and Capt 3d Rank A. Biryusov: "Certain Results of the Falkland Conflict"]

[Text] At present, when 2 years have already passed since the end of the military operations between Great Britain and Argentina, foreign specialists are continuing to analyze the Falkland conflict and draw conclusions which, in their opinion, must be considered in the organizational development of the armed forces of the Western countries.

British imperialism, having conducted a large-scale military action in the aims of confirming its colonial rule over the Falkland (Malvinas) Islands, has again shown the world where the true threat to the security of peoples derives.

What actually forced the British government to resort to the use of its military machine in the remote South Atlantic, in an area some 8,000 miles (almost 15,000 km) away from the British Isles? The Western press has given a number of reasons of an economic, political and military nature which impelled the English ruling circles to such a step.

The Falkland (Malvinas) Islands for Great Britain play the role of a support point in the policy of maintaining the nation's influence in Latin America and make it possible to control the sea lines of communications running through the Strait of Magellan and the Drake Passage. It is also assumed that this still little-investigated area of the South Atlantic has major raw material resources. Exploratory drilling has provided reason to assume that there are major oil reserves between the Falklands and the East Coast of South America.

Let us remind the readers of certain events in the Anglo-Argentine conflict. The British government in drawing out in every possible way a resolution to the question of Argentina's territorial demands, set the goal of maintaining the right of possession of the Falkland (Malvinas) Islands at whatever the cost and did not imagine that Argentina would be capable of decisive steps to establish its own control over the designated territory. Here the English government, in the opinion of Western specialists, planned on the favorable coming together of the following factors: the unstable domestic political, economic and social

situation in Argentina; support for Great Britain from the United States and the European partners in the NATO bloc and the EEC; the nonintervention of the Latin American states into the territorial dispute of the two countries; the comparative weakness and relatively low training level of the personnel in the Argentine Armed Forces; the higher skill level of the personnel and the qualitative superiority of the combat equipment of its Navy.

For this reason, the first military actions by Argentina (the landing of a small force on South Georgia Island and the establishing of control over the Falklands), were not taken seriously by the British government, assuming that this was a regular demarche of the Argentine authorities. But the British Ministries of Defense and Foreign Affairs underestimated Argentina's actions, although they had promptly received information on the intentions of the latter. At the same time, it was pointed out that even before the opening up of active operations by Argentina, Great Britain on the basis of the obtained intelligence data had begun to carry out extraordinary plans related to the use of the armed forces on overseas territories. The military experts have explained precisely by this circumstance the fact that the deployment of the English Navy and the sending of it into the South Atlantic commenced 2 days after the appearance of the Argentines on the islands.

During the months which preceded the crisis, the internal differences had grown stronger in the camp of the English Conservatives. Dissatisfaction with the policy of M. Thatcher was expressed not only by the opposition forces but also by certain leaders in the ruling party itself. Thus, the former Prime Minister E. Heath and the former Cabinet Minister I. Gilmour, in speaking at the Conservatives Conference in Blackpool, pointed out that if the current leadership did not abandon the course carried out by it and did not make changes in it which would consider the real situation (the economic crisis and the dissatisfaction of the English public), the ruling party could expect an inevitable defeat.

In endeavoring to strengthen its positions, to check the wave of antiwar actions and distract the people's attention from the urgent internal problems, the Thatcher government immediately used the conflict for strengthening chauvinism and blind patriotism, thereby hoping to find support among the English petty bourgeois Philistines. The foreign press has pointed out that the Conservatives succeeded in this to a definite degree.

The Western military experts view the armed clash of the two countries as a local war involving various types of armed forces with a decisive role played by the Navy. They see the particular feature of this in the following: none of the sides announced a state of war with the enemy; military operations were limited both in terms of the number of participants and also in terms of territory; there was no real threat for the population of the countries participating in the conflict; the sides did not set as their goal the altering of the political status of the opposing state.

The British military-political leadership bet primarily on military force, planning to achieve victory in the shortest time. The quick conclusion of the campaign was extremely essential to it in order that world public opinion did not act as a unified front in support of Argentina with no third party intervening in the conflict, and also due to the severe climatic conditions and the great remoteness of the area of combat from British territory.

In the foreign press, on the question of events in the South Atlantic, an important place as before has been given to examining the results of the conflict in all stages of it: an evaluation has been given for the measures related to the deployment of the British Armed Forces in the remote area and to the organizing of command and combat support for all types of defense of the ship formations during their move at sea and in the conflict area; the strong and weak points of the landing operation and combat operations as a whole have been analyzed. Briefly these results come down to the following.

The mobilization measures were carried out in accord with a decision of the British military-political leadership, and in particular, the maritime fleet was partially mobilized in a short period of time. As was stated in the "White Paper: Lessons of the Falkland Campaign," a total of 45 civilian vessels were involved and these underwent refitting. They were used for transporting personnel, combat equipment and materiel for logistical support as well as tugs, floating shops and hospitals. In addition, 44 ships and 22 auxiliary vessels were taken out of the reserves for the fleet. The combat equipment assigned to the expeditionary forces was reequipped considering the forthcoming tasks. Thus, on each of the container carriers there were two landing areas for the vertical take-off aircraft and helicopters. On certain vessels weapons systems of the container type were installed. All the necessary preparatory work was carried out in the shortest possible time and with rather high quality, demonstrating the significant capabilities of the shipbuilding, ship repair and other sectors of British industry to convert the enterprises to a wartime footing.

Reservists were called up on a limited scale. For example, only 300 men were called up from the Navy reserves and leaves were canceled only for a certain category of Navy personnel. The Command of the British Armed Forces planned to call up an additional number of reservists for military service in the event that combat operations assumed a protracted nature and involved heavy casualties. Along with the regular crews, reservists were also partially used to bring the civilian crews of the commercial vessels up to strength. The success of the mobilization measures carried out under emergency conditions was achieved, as foreign specialists feel, due to the developed cooperation of the staffs of the Armed Services with the administrations of the maritime fleet and the rear and transport bodies of the Ministry of Defense. For ensuring normal activities of the expeditionary forces, 3-month supplies of materiel were quickly established.

The deployment of the British Armed Forces and their move into the South Atlantic commenced on 27 March 1982 and was carried out in three waves. The first was made up of ships and vessels which were at points closest to the area of forthcoming military operations. Subsequently, the second (18 April) and third (10 May) waves were organized and sent there. The arrival of the last ships and vessels in the South Atlantic ended on 16 June. Thus, the measures to deploy the forces, judging from the statements in the Western press, lasted around 80 days. Over this time up to 50 combat vessels and over 40 auxiliary vessels were moved into the area of the Falklands. These carried some 40 Sea Harrier and Harrier-GR.3 aircraft as well as more than 130 helicopters. The overall balance of forces of the sides deployed by the start of military operations was: for ships of the basic classes 1:1 and for aircraft 1:7 in favor of

Argentina; for antishipping missile launchers 1.5:1 and for antiaircraft missiles on ships 7:1 in favor of Great Britain.

English military experts have pointed out that the measures carried out by the British Command in a short period of time to deploy the expeditionary forces in the South Atlantic did not allow the Argentine troops to dig in sufficiently on the islands, to fully transport the essential logistical means from the continent and effectively train the personnel to repel the attacks by the enemy formations and units.

The rapid deployment of the English Navy was possible due to the absence of any resistance from the Argentine Navy and Air Force. Due to the involvement of a large number of auxiliary vessels, the Royal Navy was able to operate continuously in the area of the Falkland (Malvinas) Islands during the entire conflict. The foreign press has also emphasized the important significance that the civilian vessels are in constant readiness to be put under the control of the Royal Navy.

Command, control and communications, in the opinion of the foreign specialists, contributed to the rather successful leadership of the troops and naval forces over the great distance. During the period of the exacerbation of the situation, in Great Britain a special (so-called crisis) committee was established and this included a number of ministers and the chief of staff of defense, with M. Thatcher heading it. The duties of this committee included the coordinating of all political, diplomatic and military efforts during the conflict as well as the elaboration of directive instructions for the commanders of the Armed Services on the activities of the expeditionary forces in the conflict area.

Overall leadership over the operations in the South Atlantic was provided by the fleet commander while immediate leadership was from the commander of the First Fleet of Surface Vessels who assumed command over the specially organized task force, and the commander of the Third Marine Brigade. Such an organization of command and control, as was pointed out in the foreign press, made it possible to respond promptly to any events in the conflict area. The press drew attention to the broad independence of operations granted to the commander of the task force. He was given only a general mission of capturing the islands with minimum losses. However, determining the specific dates for the start of the operation remained with the British government.

Satellite communications was the basic and most dependable channel over which leadership of the expeditionary forces was provided. As was pointed out by military experts, regardless of the enormous flow of information, important reports were transmitted efficiently. According to a statement of the representatives of the British Ministry of Defense, the designated war was "useful from the viewpoint of gaining experience in leadership of the troops conducting combat operations a great distance away from the homeland."

Reconnaissance, as an important type of combat support, played an essential role in the Anglo-Argentine conflict. Foreign military specialists have seen the reason for Britain's success in the sufficiently organized support of intelligence operation for the nation's military-political leadership and the command of the expeditionary forces and in the carrying out of a range of measures to

confuse the Argentine government. Here the Western press has emphasized the great importance of American intelligence data turned over to the British government with which it would have been unable to so quickly carry out the measures and the command of the Armed Forces would have been unable to effectively influence the course of combat operations. In providing the necessary information a special role was played by the reconnaissance satellites as well as the U.S. aviation patrolling in the Southwest Atlantic. American intelligence turned over to the English Command data on the composition and position of the Argentine units and subunits on the islands, the coordinates of the combat ships and information on the weapons systems used by the Argentine troops. This information was supplemented by information from the English intelligence sources deployed in the combat zones. It was stated that not only the landing areas but also the routes on land were first examined by reconnaissance groups which were landed ahead of time from submarines, helicopters and so forth.

All the basic command and control bodies as well as the formations and units were engaged in disinformation measures. Thus, for confusing the Argentine troops, the military-political leadership of Great Britain worked out a special plan. It outlined the tasks for misinforming them for the bodies of the press, radio and television, a strict military censorship was put into effect, controls on radio traffic were instituted and other questions clarified. The foreign press pointed out that due to these measures, the English command succeeded in achieving the set goals using limited forces, within a short period of time and with insignificant losses.

Naval combat operations. The command of the British Armed Forces in resolving the conflict by military means wagered on the broad use of the naval forces, assuming that the success of the operation to capture the islands would depend primarily upon the outcome of the engagements at sea. For this purpose, virtually all classes of ships were included in the task squadron, including: nuclear submarines, ASW carriers with airplanes and ASW helicopters on board, guided missile destroyers, guided missile frigates and so forth.

The move of the British ships to the area of combat operations was carried out in cruising orders with all types of combat support. It was expected that the Argentine Navy would resist the task squadron on the approaches to the Falkland (Malvinas) Islands and for this reason in the area of the islands and for this reason two nuclear torpedo submarines were sent out ahead of time to the area of the islands and these played a significant role in limiting the enemy's activities. After the sinking of the cruiser "General Belgrano" (the first combat employment in history of a nuclear torpedo submarine), the Argentine Navy virtually did not go beyond its territorial waters. This made it possible for the English expeditionary forces in a short period of time to carry out the task of sealing off the islands.

With approximate equality in the number of ships on both sides, the English task squadron had qualitative superiority, it possessed greater strike power and had significant capability to provide ASW defense and effective air defense (at high and medium altitudes) as well as a well organized logistical system.

Foreign specialists have pointed to certain particular features in the use of the ASW carriers "Hermes" and "Invincible" during the move at sea into the South

Atlantic and in the area of combat operations. Thus, in the first stage these were employed as flagships of the carrier search and attack groups while in the area of the islands they operated as an attack force, having onboard only the Sea Harrier aircraft. Thus, the views of a number of English experts were confirmed on the purpose of this class of ships as well as the focus of their combat training as multipurpose vessels capable of carrying out missions of an operational-tactical scale (combating submarines, winning air supremacy, supporting and providing an air cover for the landing forces).

The ships of the destroyer-frigate class during the conflict carried out missions inherent to them. They provided ASW and air defense for the task squadron and landing equipment at the moment of the landing of the amphibious force, they provided fire support for the ground troop and marine subunits in conducting combat operations on the islands and also participated in other measures.

As has been announced in the foreign press, the Argentine Navy had a number of significant advantages (the proximity of its bases, the possibility of supporting the naval forces with tactical aviation both from the continent and from airfields on the islands), however these were not fully utilized. The expected general engagement at sea did not occur and only individual Argentine Navy vessels participated in the operation while combat operations at sea assumed the appearance of a clash of Argentine aviation with the British naval and air forces.

Air combat operations. According to the estimates of foreign specialists, an important role in the Anglo-Argentine conflict was played by aviation and missile weapons which were employed by both sides with maximum effectiveness, with the qualitative superiority of the weapons and combat equipment having a substantial impact on the course of the air battles. The English units were equipped with the modern Sea Harrier and Harrier aircraft while the Argentine troops had obsolete-design aircraft, with the exception of six Super Etendard armed with the Exocet missiles.

In the course of the Anglo-Argentine conflict, the British aircraft and helicopters, having flown a total of 23,725 hours, made 12,757 aircraft sorties: the Sea Harriers (28 aircraft) around 1,200 and the Harriers (14) some 150. The pilots of the Sea Harrier aircraft made up to 6 sorties a day, each flight lasting around 1.5 hour. In the air subunits each day 95 percent of the aircraft was in full combat readiness and this made it possible to carry out virtually all of the planned combat flights.

The effectiveness of English aviation in the air battles, in the estimates of foreign specialists, was also determined by the high pilot training level and by the precise cooperation of the combat vessels and aircraft (often the latter were guided to the targets using the data of ship radar). Along with this the foreign specialists have also noted the professionalism of the Argentine pilots who in obsolete-design aircraft conducted active combat operations at the limit of their combat range. For breaking through the air defenses of the enemy navy task force, they made flights along several routes, low-altitude overflights across the patrol areas of the radar picket vessels, approaching the attack from several directions and also employing feints.

In the course of the conflict, the English Command used seven types of helicopters (around 200 units). These carried out various missions: ASW defense of the ships and vessels of the expeditionary forces, attacking surface and land enemy targets, conducting reconnaissance, landing and picking up reconnaissance-sabotage groups, transporting the personnel of the landing subunits, weapons and military equipment as well as logistical means. The intensity of helicopter operations surpassed the standards set for peacetime by more than 3-fold. As the foreign press has announced, in the course of the landing operation, an important role was played by the ship-based helicopters each of which flew up to 270 hours which is the equivalent of the annual flying time under ordinary conditions.

English aviation widely employed midair fueling. As a total during this neocolonialist campaign, around 600 refuelings were carried out with 6 unsuccessful attempts. It was pointed out that the Argentine Air Force also endeavored to organize midair refueling of its aircraft, but due to the bad weather conditions, particularly poor visibility, this was not always successful. Considering that shore-based patrol aviation was the main threat for the British expeditionary forces, the English Command endeavored to keep its ship groupings beyond its range.

A number of types of missile weapons was tested out directly in the combat situation. In the estimate of foreign experts, the French-produced Exocet antishipping missiles were the most effective and these were employed by the Argentine aircraft. Of the five missiles launched, two sank two targets (the guided missile destroyer "Sheffield" and the container vessel "Atlantic Conveyor"). However, these subsequently were less effective due to the use of radioelectronic countermeasures and the Seawolf antiaircraft guided missiles. The Sea Skua missiles of the "air-to-ship" class were tested under combat conditions and supposedly showed rather high effectiveness. These missiles were used by the English deck-based Lynx helicopters (four missiles sank two patrol boats). Also effective were the air-to-air Sidewinder guided missiles (24 of the 27 hit the target) as well as the Sea Dart, Seawolf and Rapier antiaircraft guided missiles.

The amphibious landing operations, as the Anglo-Argentine conflict reaffirmed, are a specific form of moving combat operations to enemy-occupied territory and into an area not advantageous for it. As the Western specialists feel, these are marked by a definiteness of goals, by surprise of conduct, by speed in achieving the result and by an offensive nature.

The main particular features of such operations in the South Atlantic were seen by the Western specialists in the short preparation of the landing forces, the broad use of reconnaissance and sabotage groups, detailed planning, careful consideration of the weak points of the enemy, and a sound choice of the place and time of the landing. For ensuring surprise in the landing areas of the feint forces, intense air and firing softening up was carried out and then large forces (tactical air and sea; a total of around 5,000 men) were landed on the coast which was without antilanding defenses. This was carried out in a short period of time (approximately 5 hours) and virtually without losses of personnel and military equipment.

Foreign military specialists have pointed out that the amphibious landing operation was organized according to the classical model worked out in recent years in exercises of the NATO Joint Armed Forces (considering geographic and climatic conditions). The forces were deployed during darkness under the cover of the carrier group and the fire support ships. The landing was carried out in several waves in four areas after which they immediately began to reinforce the beachhead and prepare the landing areas for the Harrier aircraft. Over the following 2 days, the English troops broadened the beachhead, they established rear supply points and moved in reinforcements. For the attack on Port Stanley, where the basic grouping of Argentine troops was, the English employed the tactics of the step-by-step capturing of positions and from there made massed artillery and mortar fire against the enemy. In increasing the offensive capabilities of the English units, an important role was played by the landing of helicopter forces deep in the defenses of the opposite side's troops directly from the transport vessels. Then the subunits carried out a march on foot.

In the aim of maintaining high battleworthiness, the English units and subunits were kept on the forward edge for 2 days after which they were pulled back into the rear to rest and their places were taken by subunits from the reserve. At the same time the Argentine command in the course of conducting combat operations did not carry out any relieving of the personnel.

The Western press has pointed out that certain subunits of the Fifth English Motorized Infantry Brigade showed poor physical training and little endurance (they were unable to make an 80-km march by foot). Reconnaissance on the tactical level was not organized with sufficient effectiveness by both sides. In particular, according to the estimates of the English intelligence bodies, at Puerto Darwin there were 500 Argentines while in fact there were 1,800; as a total there were 12,000 defenders of the island and not the 8,000-9,000, as intelligence had reported. The Argentine garrison at Port Stanley did not follow the moving up of the English units from San Carlos and did not attempt to make preemptive strikes against them although there were possibilities for this. They actually did not use the night vision instruments and large supplies of weapons, ammunition and gear were left at dumps until falling into English hands.

Rear support for the operation of the expeditionary forces in the South Atlantic was one of the most important tasks of the Royal Navy and, as was pointed out in the foreign press, in terms of organization differed substantially from that usually worked out in the course of the exercises of the NATO Joint Armed Forces. In particular, this was reflected in the establishing of a forward rear support point on Ascension Island. Moreover, civilian vessels requisitioned or chartered from the commercial fleet were used in transporting the troops and military cargo. The move at sea was carried out both as convoys and by single ships and vessels at high speed with antisubmarine maneuvering and the observance of radio silence.

Military transport and civil aircraft were also used to transport objects of logistical support along with ships. It has been pointed out that aviation delivered cargo basically as far as Ascension Island. Subsequently, it was transported to the area of combat operations by auxiliary vessels.

In the course of the campaign, around 2,000 operations were carried out to replenish the ship supplies at sea including up to 1,500 of them for the delivery of fuel by tankers.

The overall results of the Falkland crisis, in the estimates of foreign specialists, come down to the following.

The navies of Great Britain and the other capitalist states, both at present and in the future, will be a reliable instrument for the demonstration and direct employment of military force outside their territory, including in areas which are great distances away. In achieving the expansionist aims of British imperialism, a major place is assigned to forward stationary bases and supply points close to the area of possible conflicts. In this regard it has been emphasized that without the base on Ascension Island, Great Britain would have been unable to successfully conduct combat operations in such a remote area of the South Atlantic.

The Pentagon has given particularly important significance to such a lesson and has established and maintains the "Rapid Deployment Forces" in a high state of combat readiness. The United States has accelerated the search for new bases for these forces in different regions of the world.

It is felt that the Command of the British Armed Forces succeeded under real conditions in carrying out a large-scale testing of the mobile supply system for ships and auxiliary vessels in the open sea with the broad use of civilian vessels. The ratio of combat ships and auxiliary vessels in the task force was approximately 1:1 and to provide the fleet's forces with everything necessary.

The foreign military specialists consider as promising the use of civilian vessels with weapons systems of the container type. In their opinion, one must consider the experience of rapidly refitting large transport vessels and carriers which can handle the operations of vertical take-off aircraft and helicopters. The Command of the Royal Navy has ordered almost 120 sets of this system for equipping the merchant vessels with helicopters and in line with this the demands on the construction of the merchant fleet have been revised.

The conflict, in the opinion of the English Command, has confirmed that for successfully conducting an operation analogous to the Falkland one, the task force should have a reliable air defense system which would include aviation equipment for early detection of low-flying targets. Only with such equipment can the defending side be capable of quickly scrambling its fighters to intercept the approaching enemy aircraft before they reach the line for firing the missiles as well as bring the other air defense equipment to combat readiness.

From the experience of the combat employment of the ASW carriers with the Sea Harrier aircraft onboard, it has been concluded that their employment is effective only in the instance that they are within the operating range of their own shore-based aviation or are part of a task force together with multipurpose carriers which would carry early warning aircraft and long-range interceptor fighters.

The Command of the Royal Navy feels that in the course of the military operations, the ships of the destroyer-frigate class demonstrated rather high combat effectiveness, particularly in carrying out the tasks of ASW and air defense of the ship formations. In this regard the Royal Navy is presently making a significant effort to carry out the program for building the guided missile frigates of the "Broadsword" class and work out designs for new ships of this class considering the experience of their combat employment in the South Atlantic. In the opinion of foreign specialists, the ships should have weapons systems for defense against enemy antishipping missiles and aircraft which attack at maximum-low altitudes. The Seawolf antiaircraft missile complexes and automatic antiaircraft mounts can be such systems.

The conflict, as is felt abroad, also confirmed the importance of naval artillery for hitting shore installations and the necessity of increasing its power. A majority of ships presently carries one 114-mm gun. As the combat operations demonstrated, this is not enough, particularly in providing fire support for the landing forces.

In the opinion of Western experts, in designing new ships, greater attention must be paid to fire safety measures. At present, they are studying the possibility of improving the design and increasing the number of watertight doors and lifeboats, and measures are being taken to change the placement of fuel tanks, to reduce the amount of inflammable materials used as well as improve the firefighting equipment and individual protective gear. It has been recommended that more attention be paid to crew teamwork in working out damage control questions for the ships and vessels.

As the foreign experts have pointed out, more effective protection of the helicopters against portable antiaircraft missile complexes should be provided and helicopter capability should be broadened in operating at night and under bad weather conditions.

The foreign press has emphasized that the lessons of the Anglo-Argentine conflict for a long time to come will influence military policy and the plans for the organizational development of the British Armed Forces. These are also being taken into account in the course of the operational and combat training of the NATO Joint Armed Forces in Europe and are also influencing the nature of the military exercises being carried out within this bloc.

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CSO: 1801/387

MILITARY ASPECTS OF U.S. CIVIL DEFENSE SYSTEM EXAMINED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 20-21

[Article by Lt Col V. Goncharov: "Civil Defense and the U.S. Armed Forces"]

[Text] The U.S. militaristic circles, in wagering on the achieving of their hegemonistic goals of unleashing a new world war, along with increasing military potential are paying great attention to the development and improvement of the national Civil Defense (CD) system. The American press has pointed out that under present-day conditions, CD has assumed much greater importance than previously and for this reason its program should be a component part in the statewide system of military preparations.

In carrying out various measures to ensure the survival of the population and economy of the nation under the conditions of a nuclear missile war, the Federal Emergency Management Agency (FEMA) has given particular attention to organizing cooperation of the CD bodies and the armed forces on all levels. This is explained primarily by the fact that the U.S. CD system does not have its own personnel and equipment designed specially to the consequences of the employment of nuclear weapons and for carrying out reconstruction work. This has necessitated the use of Armed Forces units and subunits for carrying out such tasks.

As has been pointed out in the foreign press, in 1967, the United States adopted a decision currently in effect according to which the Armed Forces are obliged to participate in measures provided in the National CD Program in the aim of providing aid to the civilian authorities in effectively resolving the problems arising under the conditions of an emergency situation. This emphasizes that the essence of assistance to CD consists in using the units and subunits as well as the materials, equipment, transport, engineer equipment and other Armed Forces resources.

In the opinion of American military specialists, the troops and naval forces are capable of providing very effective aid to the civilian authorities, as they include well-trained and equipped engineer and medical subunits, signals subunits and military police. At the same time, the guiding documents draw attention to the fact that all measures should come down chiefly to providing effective aid to the civilian authorities in wartime and not taking over their functions as would contradict the basic purpose of the Armed Forces. Naturally, this should not be to the detriment of the carrying out of the basic missions

by the troops, primarily in the area of conducting combat operations or their support. For assisting the CD bodies troop units are to be used which are not involved in combat operations.

In the United States very great importance has been given to planning CD assistance and this is carried out on all levels of the Armed Forces. On the federal level the person responsible for this is the commander of the U.S. continental armies. The organization of all measures related to CD and supervision of their execution are entrusted to the deputy chief of staff of the army for operational questions and under his leadership the staff works out a federal plan for collaboration of the Armed Forces with the CD bodies. This plan is a document on the basis of which, under emergency conditions, aid is organized to the civilian authorities. It indicates what personnel and material resources are to be allocated by the Department of Defense and the Armed Services, what missions they are to carry out, the methods of controlling the forces, the principles for the expenditure of supplies of food, gear and various equipment, as well as the proeedure for issuing these to the civilian bodies in the states and on the spot.

On the basis of the federal plan, the commanders of the field armies together with the commandants of the naval areas and the chiefs of the Air Force Reserve areas, work out CD support plans within the district and these are sent out to the adjutant generals who are members of the state district. The adjutant generals are directly responsible for working out and implementing the plans for military CD support within the states. Copies of these are sent to the commanders of the formations and units located on the territory of the state and these units and formations will be involved in providing CD aid.

CD support from the armed forces envisages the providing of aid to the CD bodies in periods before nuclear attacks as well as during and after them. Prior to these attacks, the following measures are to be carried out: the coordinating of CD measures between the military organizations and CD staffs on all levels, the working out of plans for the joint use of shelters, manning the CD communications systems, the turning over of certain articles of logistical support to the CD bodies and providing aid in working out and conducting CD exercises.

During the nuclear attacks, aid will basically come down to the prompt notification of the CD leading bodies of this.

Recently provision has been made to reconnoiter the strike areas, assessing the damage caused, the participation of the troop units in restoring the systems of communications, electric, gas and water supply, oil pipelines, transport and vitally important enterprises, extinguishing fires and carrying out rescue work, evacuating persons from dangerous areas and providing them with essential medical aid, supplying the population with food products, maintaining public order and so forth.

As has been pointed out in the American press, the troops allocated for carrying out CD tasks undergo the appropriate training and are regularly involved in exercises and measures to eliminate the consequences of various natural disasters, emergencies and catastrophes.

The support of the CD bodies by the armed forces is carried out, as a rule, upon request from the civilian authorities. At the same time, the command will carry out certain tasks upon its own initiative, as is necessary. In particular, these include the following: transmitting data on enemy strikes made against U.S. territory, determining the coordinates and parameters of nuclear explosions, forecasting the radiation situation, determining the degree of destruction to vitally important installations and a number of others. These tasks are carried out on a federal level with the informing of the appropriate CD bodies of the obtained data.

On the other hand, the emergency CD plans of the states and the separate District of Columbia also make provision for providing help to the troops when necessary. The foreign press has pointed out that in the event of war, the first to be hit by nuclear missile strikes will be major military installations located on U.S. territory. As a result, a significant portion of them could be destroyed and the troops located at these installations will suffer severe losses in personnel, military equipment and other materiel. In such a situation, separate troop units and subunits will not be able to be used for carrying out tasks in providing military support for the CD and themselves will need aid from the civilian population, in particular, on the questions of medical support, the transporting of wounded, the billeting of the personnel, the supply of food and so forth.

As follows from what has been said above, the support for the CD bodies from the Armed Forces is basically planned for wartime. However, they also carry out a number of missions for CD purposes in peacetime. For example, the Communications Command of the U.S. Army is responsible for the work, technical maintenance of the CD Communications Center, while the North American Air Defense Command (NORAD) is responsible for alerting the nation's population. The corresponding military specialists operate all the electronic computer equipment in the CD bodies and they regularly inspect and repair the dosimetric instruments. Various scientific research is conducted for CD purposes and plans for protective structures are also worked out.

The program for using armed forces reservists has had a great impact upon improving the U.S. CD system. According to this program, more than 1,000 reservists have been assigned to the leading CD bodies. By manning the staffs with trained personnel from the Armed Forces, there has been a significant improvement in the capabilities of the local authorities, the state and federal governments on the questions of planning and carrying out emergency measures.

In the opinion of the U.S. military leadership, the presence of the plans which have been worked out and issued to the corresponding CD bodies and Armed Forces will make it possible to establish their effective cooperation in carrying out the tasks related to protecting the population and eliminating the consequences of nuclear strikes.

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CSO: 1801/387

ENGINEER SUPPORT FOR RIVER CROSSING BY U.S. ARMY DIVISION VIEWED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 23-27

[Article by Candidate of Military Sciences, Docent, Col (Res) Yu. Korolev: "Engineer Support for a Divisional Offensive With the Crossing of a Water Obstacle"]

[Text] In the general system of aggressive preparations against the Soviet Union and the other socialist commonwealth states, the Pentagon leadership gives great attention to preparing the troops for conducting offensive combat operations. Here it has emphasized that success in combat will depend largely upon the ability of the ground forces to cross the water obstacles which abound on the territory of many European countries as well as upon how effective their engineer support is.

The foreign military press has stated that engineer support for a division-level offensive with the crossing of a water obstacle presupposes the carrying out of a range of measures in the aim of establishing favorable conditions for it to carry out the set missions. This involves engineer reconnaissance of the terrain on one's own and opposite banks and the water obstacle itself, the equipping and maintaining of crossings, the preparation of the jump-off areas for the crossing and the ways for moving up the troops and their executing of maneuvers, the deactivating of mines and other river obstacles, the carrying out of camouflage measures and so forth. As American military specialists feel, here the main aim is to maintain a high rate of troop advance.

Depending upon the existing situation, the nature of enemy resistance and the presence of crossing equipment, the crossing of a water obstacle, in the views of the U.S. Army Command, can be carried out without a halt or with planned (preliminary) preparations.

The first method is considered the most effective. This consists in the rapid advance of the troops on the water obstacle along a broad front, the crossing of it and the development of the offensive in depth on the opposite bank. The second is recommended in the event of an unsuccessful attempt to cross without a halt, with an offensive directly from the water obstacle and also when the obstacle is a major impediment or the enemy has created a strong defense on it.

The crossing of a water obstacle is a special type of combat operation and is planned as a part of offensive combat. The difficulty of this includes the carrying out of measures to mislead the enemy (the preparation of false crossing points, the establishing of groups of men and weapons on secondary sectors and so forth) and ensuring secrecy (the camouflaging of the crossing equipment, the moving of this up to the crossing point at night or under conditions of limited visibility as well as the setting of smokescreens in the crossing of the troops).

According to the data of the foreign press, the present U.S. mechanized and armored divisions are equipped with a significant amount of various amphibious crossing equipment, including 16 bridge vehicles and 8 ramp amphibious vehicles from the MFAB-F self-propelled pontoon park, 12-16 AVLB tank bridge layers, 2 sets of LTR light transport rafts, 18 inflatable assault (15-seat) boats and 12 reconnaissance (3-seat) boats and around 700 amphibious tracked and wheeled armored personnel carriers.

As the American military specialists have pointed out, in crossing narrow water obstacles and in individual instances also medium-sized ones without a halt, as a rule, a division does not receive reinforcements as it is felt that it has a sufficient amount of regulation landing and crossing equipment. In the event that it is operating on the main sector, it is recommended that it be reinforced with 2-4 engineer battalions, 2 or 3 self-propelled floating bridge companies and a company of engineer vehicles from the army corps.

The brigades advancing in the first echelon of a division, for ensuring the crossing of narrow water obstacles, can be given a raft platoon (8 bridge and 4 ramp amphibious vehicles, a total of around 70 m of bridging) as well as inflatable assault boats, and in crossing medium and broad water obstacles, one or two companies of self-propelled floating bridges. Each such company can put up a bridge of the 60 class with a length of 212 m or two or three such bridges with a length of 117 and 85 m, respectively, or assemble 6 rafts of the 60 class as well as provide the assault crossing of the infantry on 15-seat inflatable boats (up to 180 men in a single trip) and lay around 150 m of flexible road surface for crossing the bankside swampy areas of terrain.

The U.S. Army Command considers the crossing of a water obstacle to be a portion of a division's combat mission on the offensive. Depending upon the location of the obstacle, this can be part of the immediate or end task. In accord with this, on the division's staff, on the basis of the overall plan for the offensive, a crossing plan is worked out (considering the missions of the troops after the crossing of the water obstacle, its nature and probable enemy resistance). The American regulations establish that the given document should reflect such questions as the configuration of the battle order of the division in approaching the water obstacle, the tasks of the forward and supporting units and subunits, the crossing front, the number of crossing sections and points, the routes for moving up and maneuvering and so forth.

For planning all the above-named measures and supervising their course, judging from recent announcements in the foreign press, it is recommended that a commander of the crossing forces be appointed (ordinarily this is the division's commander or his deputy) under whom it is proposed that a special work body be

established including officers from the engineer troops, air defense, defense against weapons of mass destruction, military police and so forth. The task of the former includes coordinating the work of erecting the crossing, the maintaining of the routes for the moving up of the troops to the water obstacle, their equipping and the security of the engineer points as well as the preparation and issuing of maps with the routes of movement. For supervising the moving up of the troops on a specific area a chief is appointed (this function is usually carried out by a responsible officer from the brigade staff) under whom are the representatives of the attached engineer subunits, the military police and so forth.

The American Command feels that for maintaining a high rate of advance for the division, the crossing plan in crossing a water obstacle without a halt is usually worked out in the brigade, and with planned preparations, in the division or corps. It has been pointed out that for this the brigade engineer (the commander of the combat engineer company) some 3 days before the crossing should study the terrain for 50 km in front as well as the commander's plan and 2 days before select the terrain maps and study the possible crossing points, some 36 hours before he should determine the requirement for equipment, 24 hours before submit a request for additional equipment and personnel, and 6 hours before turn over to the subunits the equipment needed for the crossing.

As the foreign press has emphasized, planning the engineer support for a division's offensive with the crossing of a water obstacle is entrusted to the divisional and brigade engineers. The basis for elaborating such a plan, in addition to the overall plan of the commander, includes the engineer reconnaissance of the enemy and the terrain. This should provide the commander with reliable information on the nature of the terrain and the water obstacle in the division's combat area, on the system of obstacles, the equipping of the positions and so forth. The collecting of data on the water obstacle should be carried out several days prior to the approach of it in order to use this period for determining the basic, actually existing and probable crossing points. The brigade engineers, in operating with the intelligence officers of the brigades and combat engineer battalions, should commence these measures immediately as soon as the necessity of a crossing is established.

The crossing of a water obstacle by a division without a halt should be carried out on a broad front without additional preparation of the troops and the jump-off areas. Here, as has been pointed out in the foreign press, certain areas are designated for the units and subunits ahead of time (for the brigades and battalions of the first echelon). Their sizes as well as the number of crossing points on them are determined by the overall plan of battle, by the tactical situation, by the presence of reconnaissance data on the nature of the terrain, the enemy's defensive positions adjacent to the water obstacle, by the nature of the obstacle and the amount of available crossing equipment. Thus, from the experience of exercises in recent years, in the zone of advance of a mechanized division, 6-8 assault crossing points have been organized (3 or 4 per first echelon brigade), 8-10 raft crossings (4 or 5 for each first echelon brigade), 2 or 4 points for the crossing of vehicles by fording or along the bottom of the water obstacle (under favorable conditions), 2 or 3 bridge crossing points (usually 1 or 2 bridges per brigade) and 1 or 2 dummy crossings. As a total up to 30 crossing points can be put up in the crossing sector of a division.

American military specialists feel that the successful crossing of a water obstacle without a halt to a significant degree depends upon the surprise and speed of reaching it and dispersion along a broad front as well as upon the rate of crossing and capturing installations on the opposite bank. Here particular attention should be given to the prompt supplying of the first echelon brigades, particularly the assault-echelon subunits, with crossing equipment from the division's combat engineer battalion and the corps engineer subunits attached to it for support.

The crossing of a water obstacle without a halt is usually carried out in the following sequence: the conducting of reconnaissance, the moving up of the vanguards and the assault echelon, the preparation of the assault-crossing equipment, the crossing of the water obstacle by the first echelon battalions (the battalion tactical groups) and the capturing of bridgeheads on the opposite bank, the assembling of rafts and the erecting of bridge crossings, the preparation of fords and routes for the tanks to cross the water obstacle along the bottom, the crossing of the river by the second echelon and reserves of the division and the development of the offensive on the opposite bank. Here the basic tasks for engineer support are the following: the moving up of the troops from the assembly areas to the crossing sections (points), the servicing of the assault boats (if they are required), the assembly and servicing of rafts, the erecting and maintaining of bridge crossings for combat vehicles, the clearing of mines and other river obstacles and the equipping of approaches to the crossing areas. As American military specialists feel, the combat engineer companies from the division's combat engineer battalion will cross the water obstacle together with the first echelon subunits to whom they are attached in readiness to carry out engineer tasks on the opposite bank. The carrying out of tasks on the initial bank and the servicing of the crossing sections (points) is to be turned over to the engineer subunits of an army corps and these are to act in the interests of the advancing division.

According to the views of the U.S. Army Command, the assault echelon of the division can include 4 or 5 reinforced battalions which, in using amphibious armored personnel carriers, landing boats, self-propelled rafts as well as bridges (in the event of their capture) and fords, cross the water obstacle and endeavor to move to the opposite bank a maximum of weapons before the enemy can regroup for a counterattack. The tank subunits in the assault echelon, if conditions allow, cross the water obstacle over equipped fords or along the bottom and operate together with the motorized infantry. When this is impossible, they cross on rafts which are put into operation usually immediately after the first trips of the motorized infantry on landing equipment.

After the assault echelon subunits have reached the opposite bank and thrown the enemy back from the shoreline, the TOE and attached engineer subunits begin assembling the rafts and putting up bridges. With their aid the remaining subunits in the division's first echelon and the basic forces of the second one cross over. On narrow and medium rivers they plan to employ a single raft and on broad ones two or three. The bridge crossing points should be in use 4 or 5 hours after the start of the crossing. Helicopters can also be used for delivering the necessary equipment to the river area.

Engineer control points which are under the chief of the crossing section are located close to the crossing points. These inspect the conformity of the vehicles to the carrying capacity of the crossing equipment. The assembly areas for the assault-crossing equipment is at least 1 km away from the crossing points. Here the crossing equipment is assembled and the necessary equipment and materials readied.

In the engineer support for the crossing of water obstacles, an important place is given to camouflage and particularly to the setting of smokescreens which can be used for concealing the preparations for the crossing as well as it itself as well as for carrying out measures to confuse the enemy. It is recommended that smokescreens be employed together with troop diversionary actions in order to distract a portion of the enemy resources from the crossing areas designated for the crossing.

Raft and bridge crossings organized from elements of the MFAB-F self-propelled pontoon park and the LTR light transport rafts from the bridge company of the division's combat engineer battalion, upon first opportunity, should be replaced by bridges on solid supports in order to free this equipment for subsequent use in the course of combat operations.

For protecting the bridges against floating mines on both sides, at a distance of 200-300 m boom and net obstacles should be set up and these, as a rule, should be covered with fire and during the night periodically lit with searchlights.

The crossing of a water obstacle in darkness is carried out observing the blackout requirements. American military specialists have pointed out that under these conditions, the time needed to equip the crossing, erect the pontoon bridges and assemble the rafts is increased by 50 percent. The approaches and exits on the crossings are marked by shining indicators, tape or other means which can be clearly visible for the personnel and the drivers of the vehicles. For indicating the route of movement on the opposite bank, illuminated or easily distinguishable markers are set out. The personnel of the engineer subunits in carrying out tasks at nighttime can be supplied with individual night vision instruments and the work areas illuminated with infrared searchlights.

The crossing of a water obstacle with planned (preliminary) preparations, judging from statements in the foreign press, is carried out, as a rule, in the following sequence: preparation and concentration of the division's units for the crossing (at the same time planning is carried out), the moving up of the division's units to the water obstacle and their deployment in battle formation for the crossing, the crossing of the water obstacle, the increasing of the men and equipment on the bridgehead.

Usually in a crossing with the planned preparation of the division, an engineer group is attached and the commander of this, as a rule, carries out the duties of an engineer under the commander of the crossing forces. The commanders of the battalions in this group will perform the duties of brigade engineers on the crossing sections for the first echelon brigades.

In the aim of misleading the enemy, it is recommended that feints be carried out, false crossings organized and the setting of smokescreens in the combat zone of the division widely employed.

The crossing of the water obstacle starts with the departure of the assault-crossing equipment with the personnel of the forward subunits and the amphibious armored personnel carriers and motor vehicles from the line of embarkation on the starting bank and ends with the capturing and strengthening of the bridgehead on the opposite bank.

The above-given certain provisions on engineer support for the advance of a division with the crossing of a water obstacle have been tested out and adjusted in the course of numerous army exercises. Among these of greatest interest, in the opinion of the foreign military specialists, are the exercises conducted by the American Command within the annual maneuvers of the NATO Joint Armed Forces under the code name of Autumn Forge. As the foreign press has announced, these work out such questions as an offensive with the crossing of water obstacles and defenses on a water line. Here great attention is given to organizing clear engineer support without which, as is pointed out, it is impossible to maintain a high pace of troop advance and establish a dependable system of defensive works.

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CSO: 1801/387

CHEMICAL, RADIOLOGICAL EQUIPMENT IN SPANISH ARMY REVIEWED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 27-29

[Article by Maj Ye. Morozov: "Protective Equipment Against Chemical Weapons in the Spanish Ground Forces"]

[Text] The command of the Spanish ground forces, in assuming the possibility of conducting a war with the use of weapons of mass destruction, including chemical ones, in recent years has paid close attention to the questions of the protection of the troops against this. At the Military Medical School in Madrid, there is a division which trains command and technical personnel for chemical warfare subunits. The principles, methods and procedures for conducting chemical warfare as well as the defense of the troops against weapons of mass destruction are set out in the manual R-0-1-10 approved by the Chief Staff of the Ground Forces in 1975. However, the Spanish military specialists feel that it is already out of date and does not meet modern requirements. At present, a draft of a new manual is being worked out as well as the accompanying aids and regulations.

According to the current manual, in each formation of the Spanish ground forces there should be a detachment of radiological and chemical reconnaissance headed by a chemical warfare officer. In the regiments and battalions a point is organized for monitoring the radiation and chemical situation and one of the staff officers is appointed the chief of this. In a company and equivalent subunits, dosimetric and chemical patrols are organized usually consisting of three men: a commander (junior officer), his assistant (radio operator) and driver of the vehicle which transports all the company's chemical equipment. The chief of the monitoring point is responsible for training the personnel of the patrol.

According to the views adopted in the Spanish ground forces, all the regulation chemical equipment is divided into chemical reconnaissance equipment (the indicator paper, the gas detector kits as well as the gas warning devices), anti-chemical protective equipment (gas masks, protective suits and antidotes) and decontamination equipment (decontamination mittens, pads, protective suits and decontaminating formulas). The equipment is divided into individual and group.

The individual equipment which is part of the equipping of each serviceman includes the following: the indicator papers and a plate for detecting toxins;

a filtering gas mask, a protective polyethylene single-use cape or a light set of the M-63 type, an atropine tube syringe and oxym tablets for protection; two decontamination mittens filled with decontaminating powder as well as several gauze pads for the purposes of decontaminating weapons and equipment for individual decontamination. The regular gear of the combat and transport vehicles includes indicator paper and one or two decontamination devices of the M-111 or M-13 type making it possible to process small areas of surface which the personnel is most frequently in contact with (steering wheel, control levers and pedals, cab doors and so forth).

The indicator paper is designed for establishing the presence and identifying droplet gases. For facilitating use, the indicator paper has been made into a booklet on the inner side of its facing is a color scale for each type of chemical substance and at the end instructions for using it. In suspecting the use of chemical agents, a sheet removed from the booklet is placed with a self-adhering indicator layer on the individual gear and combat equipment. With the falling of gas drops on them, the color changes on the indicator paper. The appearance of orange or bright yellow spots on the paper shows the presence of toxins like sarin or soman and red spots shows yperite and lewisite and green spots shows VX.

The regulation gas mask of the Spanish Army is the model M3-77 with a hopcalite canister. This is the only article of chemical warfare gear produced in the nation (approximately 30,000 units a year).

The M-63 all-arms film single-use set of French production consists of a cloak, gloves, overboots and a bag for carrying it. Judging from information in the foreign press, in the near future the Spanish Ground Troops will receive a new set of protective filtering clothing (of the adsorption type) of joint Spanish and West German development. This will be worn over the field uniform or underwear, it is of protective color and has patch pockets.

The chemical reconnaissance instrument (a hand gas detector) consists of a box with a lid and a hand pump, caps, cassettes with indicator tubes and other articles fitted in them. Inside the indicator tubes are the filler and chemical agents. The principle for determining the toxin is based upon a change in the color of the filler in passing through the analyzed air. There is a shoulder strap for carrying the device. The set also includes a box with spare parts and a set of ampoules.

The collective protective equipment against chemical weapons is concentrated, as a rule, in the companies. For reconnoitering contaminated zones, the company has a chemical reconnaissance device, an automatic DETALAC gas detector, indicator pads for the personnel and vehicles (these differ only in size), a set of boundary markers, six reusable protective sets of the M-67 type, six probes for taking samples, one gas decontamination instrument of the M-111 or M-13 type as well as auxiliary equipment including three cans with talcum powder, 20 rolls of adhesive tape, 20 cellophane bags for contaminated clothing and gear, a set of blanks for reporting on the chemical and radiation situation and a code table. For carrying out special processing, the company has three liters of decontamination fluid, 120 kg of a 2/3-base salt of calcium hypochlorite, 40 kg of caustic soda, one can with a decontaminating solution, two

motor-operated pumps, one rubber tank for water with a 3 m^3 capacity and six reusable protective sets of the M-66 type. In addition the company has equipment for the repair and maintenance of the chemical equipment, spare decontamination gloves for special processing, tube syringes, light protective suits of the M-63 type, gas masks for 50 percent of the personnel as well as a roll of cellophane film (140 cm wide and 50 m long). The company also has a light vehicle for transporting the above-mentioned equipment.

The French-produced DETALAC automatic gas detector is designed for detecting neuroparalytic toxins according to the flame spectrophotometry principle. The instrument is of relatively small size. It possesses rather high sensitivity making it possible to detect a toxin in the air in concentrations of less than 0.05 mg/m^3. With higher concentrations (for example, 2 mg/m^3), the alarm signal is given in less than 2 seconds. The set also includes a remote control and alarm signal panel as well as a reel with cable (400 m long).

The regulation boundary marker is a right triangle (the length of a leg is around 200 mm) of yellow color. On the front along the edges are the words "Gas" or "Atom" so that the words can be read in any position of the triangle. At each point of the marker there is an opening by which it can easily be put on a rod, stake, tree or wire obstacle. On the backside are data describing the radiation or chemical danger as well as the time and date the marker was set up. In the future the above-described marker will be replaced by a new one which has been adopted as standard in the NATO armies.

In the formations there are virtually analogous chemical reconnaissance equipment but a larger amount of them, including the chemical reconnaissance instrument, the DETALAC automatic gas detector, the indicator pads for the personnel and vehicles. Spare equipment (gloves, tube syringes, gas masks, the filtering cartridges for them and spare parts, the light and special protective sets and so forth) is reserved for 10 percent of the personnel. On this level they can deploy a special processing point (station) for the personnel, weapons and gear. This point is equipped with a trailer with two motor-driven pumps and a water heater (essential for special processing and gas decontamination) as well as a tank trailer and a rubber tank with a capacity of 3 m^3 of water. The equipment is transported on a 4-ton vehicle.

The point is usually located in tents. Their actual layout on the terrain can vary but a sequence is always maintained. For example, the personal cleansing line consists of seven tents. In the first the dosimeter readings are read and each serviceman is issued a chest number, in the second the contaminated weapons are turned in, in the third the personnel leaves the contaminated clothing and underwear and takes a shower. In the fourth tent there is primary monitoring of the degree of radioactive contamination, in the fifth the men, in passing through a jet of warm air, are dried off, in the sixth a repeat monitoring of radioactivity is organized and in the last they are given fresh underwear and clothing. After this, the personnel are returned to their subunits. In parallel with the personal cleansing, radioactive and gas decontamination are carried out on the weapons, supplies and clothing.

As the Spanish military specialists feel, the success in protecting the troops against weapons of mass destruction can be achieved only in the instance that

all measures are carried out comprehensively, with close cooperation among all services. In considering the poor equipping of the troops with chemical protective equipment, the Command of the Spanish Ground Forces has emphasized the individual training of the personnel and its moral-psychological strengthening, carrying out recently ever-more exercises with the simulating of the employment of nuclear and chemical weapons. At the same time, with the help of the NATO countries it is planning to bring about a further improvement in the protective equipment and this, in its opinion, will make it possible in the event of real combat operations to ensure the survival and continuing battleworthiness of the personnel on a sufficiently high level.

10272
CSO: 1801/387

ENGINEER COMBAT EQUIPMENT IN U.S. ARMY DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 29-34

[Article by Engr-Col L. Sergakov: "Engineer Equipment of the U.S. Ground Forces"]

[Text] At the start of the 1970's the United States began paying more attention to the questions of equipping the Ground Forces with more effective models of engineer ammunition and equipment. Judging from statements in the foreign press, this was caused primarily by a desire to provide the necessary mobility and protection for the troops in the field under present-day conditions as well as reduce the mobility of the enemy troops as much as possible. In recent years, the U.S. Army has altered the organization and establishment of the engineer units and subunits and has begun developing new engineer equipment being received by the Ground Forces. All these measures, the American military specialists feel, should substantially increase the combat and technical capabilities of the engineer troops in conducting combat operations employing both conventional and nuclear weapons.

Mines and equipment for laying mixed minefields, in the opinion of military experts, are of primary importance for engineer support of combat operations. A characteristic feature of the present state of mine and explosive equipment in the U.S. Army is the presence in the troops, along with new engineer ammunition, of obsolete models which possess poorer tactical and technical performance and, as a rule, are designed to be laid manually or with minelaying trailers.

Among the obsolete models are the M15 and M19 antitank track-cutting mines and the M21 belly-attack mines. The first is made in a round metal housing and has a rather strong explosive charge (10 kg). It can be provided with mechanical or hydromechanical fuzes. Mining is carried out with a M57 minelaying trailer with a plow-like working part. The minelayer is designed to be operated by four men and productivity in laying mines on the ground's surface is up to 600 units an hour.

The M19 mine (weight 12.6 kg, explosive charge 9.5 kg) has a plastic housing and is not detected by an induction mine detector. It comes with a special mechanical fuze. The mine's sealing makes it possible to lay it in shallow water in building antilanding barriers.

The M21 directional belly-attack mine is employed by all branches of troops. It is made in a steel metal housing and is equipped with a rod-type, pneumatic or proximity fuze. The mine is laid in the field by hand. It is designed to hit tanks and other armored vehicles by piercing the belly. The explosive charge (weight 4.8 kg) has a concave casing from sheet steel and upon exploding this gains rather high initial velocity and is capable of penetrating thick armor.

The M24 side-attack mine is viewed by American specialists as a means for reinforcing and complementing the other types of mines. It is felt that it is best to employ this for making obstacles on roads, in narrows and on streets in conducting combat operations in population points as well as for covering the passages through various obstacles. The given mine is a regulation M28 antitank hollow-charge HEAT rocket (the caliber of the warhead is 88.9 mm), which is fired automatically (when the target trips the extension electric contact which is laid on the road) at the side of a moving armored target from a tubular container or guide which is set up to 30 m from the probable tank route.

As a result of the research and development carried out to replace the obsolete models, the United States has developed a family of new mines and mining systems called FASCAM (Family of Scatterable Mines) for laying mixed minefields in a short period of time and at various distances from the position of one's troops. The first such model is the M56 helicopter mining system adopted by the ground forces in 1973. The M56 track-cutting mine which is part of it has an aluminum housing made in the form of a half-cylinder with four stabilizing planes which open during flight. This is equipped with an electronic contact fuze. The mining system itself includes two canister units which are mounted on the UH-1H Iroquois helicopter and control equipment. Each canister includes 80 mines located in pairs in cylindrical guides. They are fired with the aid of a pyrotechnic cartridge. It has been stated that in one flight a helicopter from an altitude of under 30 m can mine a strip of terrain (with a density of 0.04 mines per m^2) some 40 m wide and up to 100 m long.

For creating antitank obstacles at a range of up to 17 km, there is the artillery mining system called RAAMS (Remote Antiarmor Mine System) adopted in the U.S. Army in 1977. This is based upon M718 and M741 155-mm canister-type projectiles each of which contains nine M70 and M73 belly-attack mines (these differ only in the self-destruct time), respectively. The mines are made in a metal housing where are located the directional explosive charge and a magnetic proximity fuze with self-destruct and antilift devices. After firing on a set leg of the trajectory of flight, the remote head fuze of the projectile is activated and the mines contained in it are released outwards, they drop in the required area and after the designated time are automatically activated. The M109A1 and M198 155-mm howitzers are used to fire the canister-type projectiles. A battery consisting of six guns in two salvos can mine an area of terrain 350 x 250 m in size.

For laying mixed minefields on the forward edge there is the ground-emplaced mining system called GEMSS (Ground-Emplaced, Mine-Scattering System) commissioned in 1979. This includes a M128 minelaying trailer and two types of mines: the M75 antitank mine and the M74 antipersonnel fragmentation mine. The first has a magnetic proximity fuze with self-destruct and antilift elements. Regardless of the low intrinsic weight, it possesses high armor-piercing capacity by

using the shock-core principle. The M74 antipersonnel mine is detonated upon the touching of one of the guy wires released when it falls to the ground. The cylindrical magazine of the minelayer with a capacity of 800 mines can lay mines of one or both types. They are released by a hydraulic mechanism through a guide the position of which determines the distance and direction of throwing. The operating speed of the minelayer is 3.5 km per hour and the throwing range for the mines is up to 30 m. It is towed by an M113A1 armored personnel carrier or by a 5-ton truck.

Remote mining of the terrain is one of the versions for the use of the new American MLRS volley-fire rocket system. For this purpose its unit of fire includes unguided missiles each of which contains several-score West German AT-2 belly-attack mines with a directional charge. The maximum firing range of the MLRS (12 guides) is more than 30 km.

A modular mining system called MRPMS (Modular Pack Mine System) is also being prepared for introduction; this is designed for rapidly laying obstacles on threatened sectors with insignificant forces. It is made in the form of a container with several guides containing antitank and antipersonnel mines. The container is transported into the area where it is to be employed on a truck and is carried to the designated area by a team of two men. The command to fire the mines is given by radio or over wires.

The United States has also developed an antipersonnel artillery mining system called ADAM (Area Denial Artillery Munition) which includes the M692 and M731 155-mm canister-type shells equipped with the M67 and M72 antipersonnel bounding shrapnel mines, respectively. Together with shells of the RAAMS antitank mining system, these can be employed for creating a mixed minefield. Each canister-type projectile of the ADAM system contains 36 mines. They drop to the ground and are activated after thin tension sensor wires are spring-released in various directions from the housing. The mine is detonated after a person touches one of the wires.

The engineer troops are also armed with models of antipersonnel mines adopted in the 1950's and 1960's and these are set by hand. These include the M14 and M25 Elsie high-explosive mines as well as the M16A1 and M26 shrapnel mines. All these models are basically employed for defending defensive positions.

In the opinion of foreign specialists, one of the most effective types of engineer ammunition designed for knocking unprotected personnel is the M118A1 Claymore directional antipersonnel mine. This was widely used during the U.S. aggression in Vietnam. Made in the form of a concave prism, it has a charge of plastic explosive with a shrapnel element of 700 steel balls. The mine comes with an electric detonator and a trip-wire mechanical fuze. Ordinarily it is placed on the ground on hinged legs and is faced toward the probable direction of the movement of personnel. The mine is detonated upon command or upon touching the trip wire. The personnel is hit with a cluster of shrapnel (with a sector up to 60°) and within a radius to 50 m.

In addition to the above-described types, the engineer troops of the U.S. Army are also supplied with special-purpose mines such as the M23 chemical mine and the M49A1 illuminating mine.

Equipment for the reconnoitering and crossing of mixed minefields. For the reconnoitering of enemy minefields, the engineer troops have the AN/PSS-11, AN/PRS-7 and -8 portable mine detectors. The first type (induction) is designed for detecting antitank and antipersonnel mines having parts made from ferromagnetic materials. It consists of a detector head, a telescopic rod, earphones and a control unit with a power source. The detector can locate small metallic objects to a depth of up to 35 cm. The time of its continuous operation is 35 hours.

The AN/PRS-7 mine detector is a radio-frequency one and employed for detecting metal and nonmetal mines. Its operation is based upon the principle of establishing a difference in the dialectric constants of the ground and the mine's material. The electronic part is made using printed circuits in the form of three replacable modules. The weight of the portable part of the mine detector is around 4 kg and the length of its continuous operation is 25 hours. In 1976, the United States began to improve this mine detector and as a result the improved model AN/PRS-8 was developed and this, in the opinion of American specialists, is a more effective means for detecting metal and nonmetal mines in dry ground. In contrast to the previous model, it has a minicomputer which provides automatic adjustment for the sensitivity of the detector head to various types of soil. The total weight of the portable part of the detector is 3.8 kg and the operating time of the lithium battery is around 20 hours.

All three detectors have a square detector head enclosed in an airtight housing and this makes it possible to search for mines in water up to 1 m deep. The width of the area coverable by the mine detectors is 2 m.

For making passageways through mixed minefields, the elongated mine clearing charges are employed. One of them, the M157, consists of separate elements which are bolted together. The total length of the charge is 122 m and the weight of the assembled set is 5 tons (around 1.5 ton of explosive). The charge is moved out into an antitank minefield using a tank and it is detonated by firing on the explosive element with a machine gun. The depth of the passage formed is more than 90 m and the width is up to 5 m.

The M173 elongated mine clearing charge is also designed for making a solid passage through an antitank minefield. It is kept on a sled and is a cable with explosive charges fastened to it. The total weight of the set is around 1.4 ton and the length 125 m. The charge on the sled is towed to the obstacle by a tank and is placed in the minefield with a powder rocket. Upon detonating the charge, a passage is made 6 m wide and 90 m deep.

For the crossing of antipersonnel obstacles by infantry subunits, the U.S. Army has the M1A1 detonating cable which is set across the obstacle by a powder rocket. In its detonating a passageway is made around 0.6 m wide and 52 m in depth.

In addition to the above-described equipment, for the ground forces a rocket-based mine clearing system, the SLU-FAE, and a roller flail have been developed. The first model has been designed for the rapid clearing of passages through minefields for tanks. It is a 30-barrel volley-type rocket system, with the warhead of the ammunition filled with propylene oxide. Each unguided missile

(each weighing 90 kg) has a brake parachute which opens at the designated time in flight. In this manner the ammunition of a single volley is distributed over distance in such a manner as to cover the entire depth of the minefield. The overpressure created in the fuel-air explosion destroys or activates the antitank and antipersonnel mines located there. A single volley can clear a passageway 8 m wide and 300 m deep. The maximum firing range for the SLU-FAE is 1,000 m and the minimum is 300 m.

The roller flail which is mounted on tanks of the M60 series consists of two sections with five steel flails. The total weight of the mounted equipment is around 10 tons. For clearing belly-attack mines with rod fuzes, a weighted chain is attached between the sections. The time required to mount the mine clearing device by a tank crew is 15 minutes and it requires 30 seconds to remove. The tank with the mine clearing device makes a passageway in the form of two tracks each 1.2 m wide. The operating speed of the tank in making a passageway is up to 16 km per hour.

Crossing equipment. For supporting a high rate of advance for the units in crossing water and other obstacles, the ground troops have light crossing rafts, tank bridgelayers, pontoon parks and prefabricated bridges.

The light transport raft is designed for transporting light equipment and infantry subunits across water obstacles. The set includes open pontoon units and track elements with intertrack panels made from aluminum alloy. The load capacity of a raft is around 11 tons and a platoon can assemble this in 30 minutes. The length of the deck is 13.8 m and the width of the roadway is 2.7 m. The raft is moved in the water by outboards or tug boats. The equipment of the light transport raft can also be employed for putting up floating or assembling single-span bridges.

The AVLB tank tracklayer is used by the armored and mechanized units. This is based upon the tracked chassis of the M60A1 tank and has a folding-type bridging unit which can span an obstacle up to 18 m wide. The drive is hydraulic. The time for laying the bridge across an obstacle is 3 minutes.

The MFAB-F self-propelled pontoon park is corps-level equipment and is employed for building crossings across broad water obstacles outside the reach of enemy fire. The park equipment includes 16 bridge and 8 ramp amphibious vehicles on wheeled chassis and these make it possible to put up a floating bridge around 120 m long in 20 minutes. From the equipment of the park it is also possible to make transport rafts for carrying freight weighing up to 60 tons.

The Ribbon Bridge tactical pontoon parks began to be received by the engineer units at the beginning fo the 1970's. These replaced the obsolete M4T6 parks which had been in the troops since the mid-1950's. The set of the new park (made from aluminum alloy, load class 60) includes 30 river (bridge) and 12 shore (ramp) folding units, each of which consists of four pontoons, two middle and two end which are hinged together. After launching on the water, they unfold and assume the designated position. The equipment can be transported on the M812 5-ton vehicles. From one park set, a bridge 212 m long can be erected or six rafts assembled.

Two types of temporary bridges: the Bailey (this is already considered obsolete) and the English MGB medium-girder bridge have gained certain popularity in the ground forces. The bridging equipment of the first type includes steel sections of the main girders, beams, flooring, ramps and connecting pieces. Various assembly systems can be employed and from the set it is possible to make single or multispan bridges for various loads. Thus, a single-span bridge 49 m long and with a capacity of around 70 tons can be assembled by a team consisting of a company in 19 hours. The building of a structure of such length is possible by employing the cable reinforcing set. The bridging equipment is transported on 5-ton trucks.

The English MGB medium-girder bridge is made from aluminum alloy. It is employed for assembling single-span bridges manually without lifting equipment, since the heaviest element does not weigh more than 250 kg and can be carried by a six-man team. In having a set of equipment, a team of 25 men in 45 minutes can put up a double-deck bridge 30 m long with a carrying capacity of 54 tons. For extending the length of its span to 49 m in maintaining the given capacity, American specialists have developed a cable reinforcing set.

Judging from statements in the foreign press, in recent years the United States has been paying more attention to developing equipment for crossing various obstacles, including water ones. Together with the FRG and Great Britain, a new generation of crossing equipment has been developed and this should be introduced at the end of the 1980's and the start of the 1990's. This will include a tank bridgelayer, a mechanized bridge and a pontoon park.

The engineer vehicles, depending upon the degree of protection for the crew against enemy weapons, are divided into two classes: armored and unarmored. The former are employed by the armored and mechanized units and used chiefly in forward areas for carrying out certain special engineer jobs. Among this type of equipment is the M728 engineer tank and the M9 universal engineer vehicle.

The M728 engineer tank (weight 52 tons) is designed for carrying out earthmoving, cargo handling and evacuation jobs as well as for destroying fortification works. It is employed by engineer battalions of infantry, mechanized and armored divisions as well as the engineer companies of separate brigades. Used as working equipment is a bulldozer blade, a crane boom with an 8-ton capacity and a winch with a tractive force of 11 tons. The basic weapon of the tank is a 165-mm short-barrel gun for firing high explosive shells at fortification works and obstacles on roads. The 750-hp engine makes it possible to reach a speed up to 48 km an hour on a highway. The M728 engineer tank can also be employed for placing the elongated mine clearing charges on a minefield and detonating them.

The M9 universal engineer vehicle is designed for carrying out the following jobs in forward areas: making passageways through rubble and destruction, laying column tracks, digging antitank pits and emplacements for tanks and artillery, building helicopter landing pads as well as preparing approach and exit ramps on bank slopes for crossing areas. It has been developed on the basis of a special tracked chassis. The working element is a double-jawed bulldozer blade with a hydraulic control system.

The vehicle can be employed as a bulldozer, a scraper, grader, a means of transport (for transporting a nine-man combat engineer squad) or as a tractor. It

carries a winch with a tractive force of more than 11 tons. In the forward part of the body there is a cargo compartment with a capacity of 5.3 m^3 while the engine and the control compartment are located in the stern. The weight of the M9 is 14.5 tons and with a full cargo compartment is around 24 tons. The vehicle is amphibious, and the maximum speed on a highway is up to 50 km an hour. The driver is located in an armored turret. The presence of a filter ventilating unit makes it possible to carry out engineer work on contaminated terrain.

The unarmed engineer vehicles are represented by a large number of different type models. These basically are earthmoving vehicles (wheeled and tracked bulldozers and excavators, loaders, graders and scrapers). These are employed chiefly in rear areas outside the range of enemy fire. Among these are models developed specially for the troops as well as commercial vehicles which most fully meet modern requirements.

As a whole, as the foreign press has pointed out, the engineer troops of the U.S. Army are equipped with all necessary engineer weapons making it possible for them to carry out their tasks. At the same time, the American Command is continuing to develop new models.

10272
CSO: 1801/387

ROLE, PLANS FOR FIBER OPTICS CABLES IN U.S. MILITARY VIEWED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 35-36

[Article by Candidate of Technical Sciences, Engr-Col N. Mishin: "Fiber Optics Cables in Weapon Control Systems"]

[Text] Fiber optics is one of the newest areas of science and technology and American military-industrial circles are endeavoring to utilize the achievements in this area for developing weapons systems. According to statements in the foreign press, the United States is conducting research and experimental design work the major aim of which is the development and subsequent employment of fiber-optical light guide cables to replace metal ones, and in particular, the replacing of the metal wires presently used for controlling the flight of antitank missiles. It is felt that this will make it possible to locate a majority of the expensive elements of the missile guidance system not on the missile itself but rather on the launch unit and thus make it possible to use this repeatedly.

The United States has already conducted flight testing on the TOW antitank missile which is controlled by a fiber optics cable (a diameter of 0.3 mm and maximum breaking strength of 140 kg/mm^2) and which during flight is unwound from a spool located on the missile at a rate up to 180 m/second, forming a two-way "missile--control panel" data transmission channel.

The foreign press has pointed out that up to now such flights have been made at a range up to 3 km and in the future they plan to launch missiles over substantially greater distances. The realizing of these plans, in the opinion of foreign specialists, will be aided by the rapid pace of improving the elements of fiber optics equipment and progress in their manufacturing techniques. Thus, one of the essential shortcomings of fiber optics communications lines is being successfully overcome. This is the rapid attenuation of the transmitted signal which limits their length. According to data given in American journals, from 1968 through 1976, the degree of signal attenuation in the fiber optics lines was reduced from 1,000 to 1.6 decibels/km. It has been stated that the use of longer wages (1.3-1.6 micrometers instead of 0.8-0.9) and light guides from new materials to transmit the signal will make it possible over the next 5-6 years to reduce signal attenuation to 0.001-0.01 decibels/km and create fiber-optics lines of sufficiently great length.

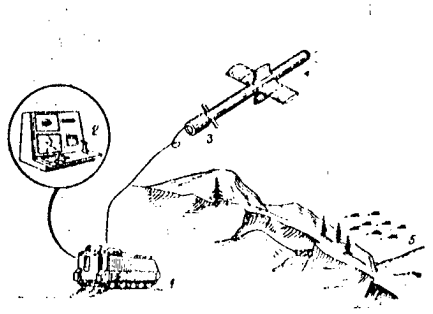

Diagram for control of missile by fiber-optics cable: 1--Ground control point; 2--Board of guidance operator; 3--Spool (coil) with fiber-optics cable; 4--Optical sensor; 5--Enemy tanks.

According to the estimate of American specialists, the switch from a metal control wire to a fiber optics line and the equipping of missiles with optical sensors (TV cameras) will simplify their combat employment. In this instance, in order to see the target and guide the missile to it, the guidance operator does not have to be close to the forward edge. He can be in an armored vehicle (see the diagram) or in a secure shelter several kilometers from the enemy tanks, and in launching one missile after another, and on the screen will observe the terrain followed by the course of flight and guide the missiles to the selected targets. There will be no need for the preliminary (prior to the launching of the missile) determining of the precise coordinates of the target, when it is beyond direct visibility. It will be enough to know the approximate area of the location of the object where the missile will be aimed and the operator will guide it accurately, using the screen which will show images transmitted over the light guide for the terrain and the target entering the field of vision of the optical sensor.

The fiber optics cables in the U.S. Army are also to be employed for controlling the flight of unmanned aircraft. From them over the light guide an image will be transmitted of the reconnoitered territory to the ground control point where this will be recorded on a video tape recorder for subsequent detailed study.

One other merit of the fiber optics cable has been noted and this is high resistance to jamming, as it and the signals transmitted over it are virtually immune to the influence of electronic pulses, including those caused by a nuclear explosion. Primarily for this reason, the launchers of the ground-based American cruise missiles the deployment of which has already started in certain Western European countries, will be connected to their launch control center not by a traditional metal cable, but rather by a fiber optics one. In the future, such cables will also connect the silo launchers of the MX ICBM with their launch control center.

Foreign specialists have predicted that fiber optics cables will replace metal ones not only in missile complexes but also in means of communications and in other types of military equipment. In particular, an onboard cable network based on light guides is being developed for the E-4B aircraft (airborne command centers). This possesses better operating properties and will be substantially lighter than the presently used network of metal cables due to the fact that the fiber optics cables have a greater capacity and do not require metal screening.

According to recent announcements in the foreign press, Lytton Industries which for 30 years has supplied to the American Army the turning contacts which provide an electrical connection between the hull and rotating turret of the tank,

at the start of 1983 received a contract to develop methods for manufacturing a fiber optics turning contact for the M1 Abrams tank. It is expected that in comparison with the existing turning contacts, the new one will be more compact and lighter while the lack of metal contacts in it will increase reliability and lengthen operating life. As a consequence of this there will also be a decline in operating expenses, since the period between maintenances is increased and the range of spare parts is reduced.

10272
CSO: 1801/387

INTERACTION OF TACTICS, EQUIPMENT IN AIR RECONNAISSANCE TRACED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 39-44

[Article by Doctor of Military Sciences, Professor, Col A. Krasnov: "Equipment and Tactics of Air Reconnaissance"]

[Text] In the process of the ever-increasing arms race and the intensified preparations for unleashing a war, primarily against the USSR and the other socialist commonwealth countries, the United States and its allies in the aggressive imperialist NATO bloc are devoting great attention to the development of air reconnaissance as one of the most important types for supporting the combat operations of their armed forces. The military experts of the leading capitalist states, in carefully studying the experience of previous wars (the so-called local wars), exercises, flight testing and experiments, have reached the conclusion that the capabilities of air reconnaissance for carrying out tasks confronting it are determined, on the one hand, by the state of the aviation equipment and, on the other, by the development level of tactics.

The foreign military press has written a great deal about air reconnaissance equipment and tactics. It has intensely advertised the new reconnaissance aircraft being delivered, their equipment and reconnaissance devices and has attempted to analyze the methods and tactical procedures for conducting arial reconnaissance of various objects and crossing the air defenses of the opposing side.

However, the relationship of the air reconnaissance equipment and tactics is viewed differently in the Western press. Certain foreign military theoreticians feel that the equipment dictates everything in air reconnaissance, because in the modern reconnaissance aircraft, a majority of the flight stages is done automatically and the activities of the crews come down basically to the role of operators. They have asserted that only the presence of modern aircraft and all-weather reconnaissance equipment determines the success of reconnaissance. The crew in the "man--machine--tactics" system, under the conditions of the high flight speed and with the high level of automating for all the processes, plays an important role only where the piloting of the aircraft and the operating of the equipment are done manually.

Other theoreticians have endeavored to establish and thoroughly study the relationship between the equipment and tactics. In tracing the evolution of these

two components, they have pointed out that under the influence of the development of equiment, air reconnaissance tactics has constantly changed. At the same time, feedback also exists in the fact that tactics poses a whole range of demands for the equipment, including on the tactical flight performance of the reconnaissance aircraft, their reconnaissance equipment, the data transmission systems and the ground crew control devices and so forth. Thus, tactics in a most decisive manner intervenes into the area of equipment.

The influence of the development of equipment on air reconnaissance tactics. In order to more clearly perceive this problem, foreign military specialists have turned to the past. Their attention has most often been drawn to the end of the 1940's and the start of the 1950's when the era of jet aviation arrived. The jet reconnaissance aircraft significantly surpassed the piston-driven planes for all indicators. Their equipment made it possible for the crews to operate during the day and at night and determine the coordinates of the reconnaissance objects with great precision. However, the sharp increase in the speed of aircraft flight became the most significant factor influencing the development of air reconnaissance tactics.

The high flight speed, in the opinion of the Western military specialists, gave the reconnaissance planes the following indisputable advantages: the crews could reach the objects of reconnaissance more quickly, deliver the acquired data and, equally importantly, better avoid meeting up with enemy fighters. As was pointed out in the foreign press, regardless of the fact that the speed of fighters had increased, the reconnaissance planes had good conditions for avoiding air combat. However, high-speed flight led to a deterioration of certain aircraft maneuvering qualities. For example, the turning radius increased sharply and the angular velocity of executing the turns dropped and this made it difficult for the fighters to close with the reconnaissance planes and assume an initial position for attacking them. Moreover, as speed of flight increased, the lines for intercepting the reconnaissance planes quickly approached the base airfields of the fighter aviation and the distance for overtaking the air targets increased progressively.

As a result, with the prompt detection of enemy aircraft in the air, the reconnaissance planes maintained the possibility of avoiding them, since the overtake distance became commensurable with the depth of reconnaissance.

However, foreign specialists have pointed out that the increased speed of flight for the reconnaissance aircraft also had negative aspects, particularly in operating a low altitudes. Piloting, orientation, and, most importantly, the conditions for conducting air reconnaissance became more complex, as the greater the speed of flight the less time the crew had for locating and identifying the objects. The latter circumstance was aggravated also by the nature of the reconnaissance objects which became small-sized, highly mobile and were carefully camouflaged in the terrain. The increased maneuvering parameters of the high-speed aircraft impeded the observance of the objects. The pilots could no longer keep the objects continuously in their field of vision as was the case during the years of World War II as the turning radius of their aircraft had become too great.

The air reconnaissance pilots were in a paradoxical situation. On the one hand, the high speed which clearly confirmed the advantages of the new equipment was extremely essential for crossing enemy air defenses and, on the other, they were unable to realize the existing opportunities. "Try to seek out and identify a small, quickly disappearing object, analyze its characteristics and photograph it, if you have a few seconds for this!" exclaimed the Western military specialists in alarm.

Thus, a barrier arose on the path of development of tactics and the first attempts to cross it ended in failure. The foreign press has pointed out that the pilots simply did not have enough time for observation and for this reason they had to either increase flight altitude or make several passes over the same object. But in either instance they became more vulnerable for the air defense weapons.

In order to maintain the valuable combat properties fo the high-speed reconnaissance planes and make speed their ally, the Western specialists in developing air reconnaissance tactics followed a path of seeking out opportunities to increase the length of observation of the objects at a high speed. Such possibilities rested in the high thrust-to-weight ratio of the jet engines as this made it possible to work out new types of maneuvers for the reconnaissance planes in vertical and horizontal planes.

The foreign press has stated that initially the basic types of maneuvers were gliding, diving, steep banks and turns. In these instances the angular velocity of the moving of the objects in the pilots' field of vision declined and viewing conditions were improved. However, it turned out that it was ill-advised to employ a vertical maneuver at a speed of over 1,000 km per hour due to the significant loss of altitude in going into the dive and pulling out from it. A horizontal maneuver also produced little, since because of the large turning radiuses it was difficult and sometimes impossible to keep the objects in the field of vision. Then the reconnaissance pilots somewhat altered their tactics. For achieving surprise they approached the objects at maximum-low altitude, in concealing themselves in terrain features and conducted observation using a hump with a turn and viewing the objects in the direction of the bank.

Foreign military specialists have stated that the use of the new types of maneuvers by the reconnaissance pilots helped to eliminate the lag of tactics behind the development level of the equipment, and this was also the case in the other areas of their contact. Some reconnaissance planes were replaced by other, technically more advanced planes. And each time that an unrealized surplus of speed, altitude, range or maneuverability was apparent, if the equilibrium between the combat properties of the equipment and the capabilities of tactics was disrupted, the specialists sought out the ways to restore this equilibrium.

How now is air reconnaissance tactics changing under the influence of the development of equipment? This question has often been discussed on the pages of the Western military press.

At present, the NATO experts consider the new equipment to be basic and the stimulus for a further improvement in tactics. The equipment has given rise to

new tactical procedures and makes it possible for the air reconnaissance pilots to maneuver in a great range of altitudes and speeds, to achieve concealment of actions, to conduct reconnaissance in a single pass and gain information about the objects while remaining significant distances from them. In this context the Western specialists have pointed out that the equipment grants the reconnaissance pilots not only airplanes with better tactical flying performance but also more advanced reconnaissance equipment.

In order to be capable of conducting air reconnaissance during the day and at night under various meteorological conditions and, most importantly, to detect objects camouflaged against observation, with the aid of photographic, infrared or some other equipment, reconnaissance complexes are being developed with equipment the operation of which is based upon different principles of detecting the targets. The equipment is located not only inside the aircraft but also in special suspended containers* in different variations chosen proceeding from the nature of the tasks to be carried out and the conditions for fulfilling them. The latter circumstance, in the opinion of foreign specialists, significantly increases the effectiveness of air reconnaissance. Fig. 1 shows the typical variations for the make-up of sets of reconnaissance equipment for the basic reconnaissance aircraft used in the military aviation of the NATO countries.

recon. plane	recon. equipment					
	a	b	c	d	e	f
SR-71	+	+	+	+	—	—
TR-1	—	—	+	+	—	—
RF-4C	+	+	+	+	+	+
RF-5E	+	+	—	—	+	—
RF-15	+	+	+	+	—	—
Mir-4"	+	+	—	—	—	—

Fig. 1. Standard variations for make-up of reconnaissance equipment sets for certain modern aircraft (the + sign means that the given type of equipment is carried on the aircraft while the - sign means that it is absent).

Key: a--Photographic
b--Infrared
c--Radar
d--Electronic
e--Television
f--Laser

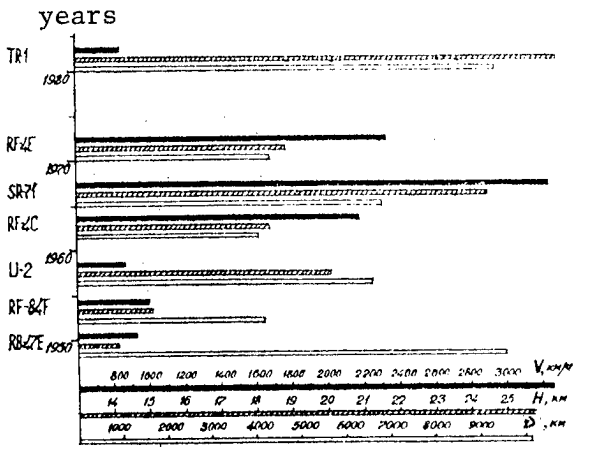

Fig. 2. Graph of tactical flight performance of American reconnaissance aircraft: V--Speed of flight, H--Service ceiling, D--Range of flight.

* For more detail on the suspended containers with reconnaissance equipment, see: ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 12, 1983, pp 59-65.--Editors.

However, the interaction of the crew of the reconnaissance aircraft with such reconnaissance equipment, as has been pointed out in the foreign press, is becoming evermore complicated and for this reason only potential opportunities are established for acquiring the required information. Correspondingly for all technical achievements, it is essential to develop new tactical procedures for conducting air reconnaissance as these would provide for the full utilization for the entire range of equipment. The crews must employ those types of maneuver which provide an opportunity to arrive at the objects of reconnaissance at the required distance, to immediately assume the initial position for observing the target with the various equipment and carrying out the mission in a single pass. But this cannot always be carried out, since in utilizing the various equipment it is essential to take into account certain conditions: for conducting electronic reconnaissance it is essential to have a great altitude but this does not always make it possible to photograph the objects on the required scale; the use of photographic equipment and particularly side-vision radars requires the more precise maintaining of flight parameters than in using electronic reconnaissance equipment; for photographing good optical visibility is required while the best time for employing infrared equipment is the predawn hours, since with daylight photographing due to the uneven warming of the terrain its overall picture and the image of the objects themselves can be distorted and so forth.

Thus, according to the evidence of the NATO military specialists, the changes in equipment have involved various aspects of air reconnaissance tactics. However, in their opinion, the development of equipment is the mirror image of the capabilities of the equipment. Constantly in the area of equipment, both favorable and undesirable phenomena develop unexpectedly for air reconnaissance and this happens rapidly as was the case with the speed of the reconnaissance aircraft. Then new barriers arise before tactics. In surmounting them, the specialists not only seek out new procedures but also make demands on the equipment, that is, contribute to its development.

The influence of tactics on the development of equipment, in the views of foreign military experts, is particularly felt in resolving the problem of having the crews of the reconnaissance aircraft overcome the opposition of the enemy air defense system (here they emphasize that the increased air defense might has always been accompanied by a rapid pace of modernizing aviation equipment). In addition, it has been essential to increase the depth of reconnaissance, its continuity and shorten the time for obtaining the information by the staffs interested in it and so forth.

One of the basic tactical procedures for crossing the air defense system, particularly by individual planes, was at one time the so-called "dash" (the "supersonic dash"): the pilot tried to dash across the dangerous zone at a maximum speed. Another procedure was a flight at an altitude beyond the reach of the antiaircraft artillery, fighters and even the enemy antiaircraft missile complexes. A combination of both these methods was considered the optimum approach.

For increasing the depth of reconnaissance and the time of observing the object, the crews were forced to fly a maximum flight distance or length and when necessary even carry out midair fueling.

The question of reducing the time required to receive data by the ground bodies was also solved by increasing the flight speed of the reconnaissance aircraft and equipping them with special devices for transmitting the acquired data from the plane while the ground stations were supplied with equipment for rapidly processing the information.

These and other demands imposed by tactics led to the further development of equipment including the aircraft, their onboard equipment and instruments. The tactical flight performance of the aircraft was constantly increased and primarily the speed, ceiling and distance of flight. This is well illustrated by the graph (Fig. 2) made considering the data published in the Western press. This compares the speed, altitude and distance of flights made by reconnaissance aircraft received successively (over 40 years) by the U.S. Air Force.

However, in the development of such aircraft, the aviation designers were confronted by many questions relating to tactics. In particular, one of the most important was how in improving the tactical flight performance should the various aspects be combined and which should be given preference even to the detriment of the remaining.

Proceeding from the requirements of tactics, the high-speed RF-4C and E reconnaissance planes were develoepd along with the low-speed but high-altitude U-2 and TR-1 and the "superfast" and "superhigh" SR-71. According to information in the foreign press, this clearly defined trend will be maintained in the future. Thus, for replacing the SR-71, plans are being worked out for a reconnaissance plane which will supposedly fly at altitudes up to 60 km and at a speed of M = 4. At the same time, it is considered advisable to also have aircraft of the U-2, TR-1 and RF-4 types.

Another, equally important question is the following: should specialized reconnaissance planes be developed or should serially-produced combat ones be adapted for these purposes? Considering the tactical, economic and other aspects, this has been resolved in a dual manner: special aircraft have been developed (the U-1, SR-71 and TR-1) while combat planes have also been modified (the RF-84F, RF-4C and so forth). The latter comprised the basis of the aircraft fleet for the reconnaissance aviation of the United States and the other capitalist states. This, according to the views of the foreign specialists, is more economic. Moreover, conventional combat and other aircraft are widely employed for conducting reconnaissance and this, in the opinion of the NATO experts, makes it possible for the flight crews not only to increase the scale of air reconnaissance but also to better study the area of combat operations, the position of the air defenses and other objects. This significantly facilitates the carrying out of the immediate tasks by them.

In reviewing the question of defensive weapons for the reconnaissance aircraft and assessing their role in protecting the crews against enemy air defense weapons, the opinions of the Western specialists diverge. As a majority of them feels, on high-speed aircraft it is not necessary to install weapons because this leads to a deterioration of its flight performance and can impede the carrying out of air reconnaissance, as the pilots can engage the enemy in combat instead of carying out the basic mission. Other specialists assert the reverse, that is, defensive weapons increase the survivability of the reconnaissance

aircraft. In line with this cannon and missile weapons have been installed on certain types of reconnaissance aircraft, for example, the RF-4E and the RF-5E.

However, all the specialists, proceeding from tactical considerations, feel it completely essential for the reconnaissance aircraft to carry equipment for warning of fighter attacks and for launching antiaircraft guided missiles against them as well as equipment for setting up jamming for electronic countermeasures against the fighter control and guidance systems. For this reason omnidirectional receivers have been installed for warning of enemy radar, ejectors for dipole reflectors and infrared decoys as well as stations for setting up active interference. For reducing the load on the crew members, a larger portion of the instruments and equipment can operate in an automatic mode.

However, as was pointed out in the English journal FLIGHT, all this protective equipment is less effective than the tactical procedures for achieving concealed operations, for example, a flight under conditions of radio silence and outside the radar visibility zones. For this reason, from the start of the 1960's, when the next jump occurred in the development of air defense weapons, the efforts of the Western aviation designers were focused on seeking out the technical opportunities for achieving undetected actions by the air reconnaissance planes. In the designs of the aircraft airframes, they began to utilize materials which absorb or disperse the radar signals. Devices also appeared to reduce infrared radiation. Using these the temperature of the engine exhaust gases is reduced (for example, by injecting additional currents of outside air) and thermal screening is provided. The foreign press has also announced the use of special camouflaging paint on American aircraft whereby only 7 percent of the striking sunrays are reflected from the aircraft's surface while with ordinary paint this is up to 60 percent.

At present, a trend has appeared to achieve undetectable operations of air reconnaissance planes by the aircraft design features. The experimental "invisible" aircraft now being designed have a low effective dispersion area due to the particular features of the aerodynamic shape, the broad use of compositional materials with low reflectivity and antiradar coverings and the equipping of them with devices to reduce infrared radiation. The tactics for the crews of these aircraft, the Western military experts feel, can be based on concealed and surprise actions both at high and low altitudes under conditions of complete radio silence.

Under the influence of the tactical demands on the equipment, not only the aircraft are being improved. For obtaining complete and reliable data on the enemy objects, particularly those protected by strong air defenses, good reconnaissance equipment is also required.

From the engineering viewpoint, the development level of such equipment is assessed primarily by the quality of the recreated image. The scientific publications abroad have pointed to the need to further increase the sensitivity and resolution of the equipment and the geometric precision of the image. At the same time, the equipment's development is influenced by the factor of the need to cross strong enemy air defenses. As a whole, as has been stated in the foreign press, the development of reconnaissance instruments and equipment is being carried out in three basic areas:

a) Providing the possibility of conducting reconnaissance at significant distances from the object and without entering their air defense zones and for this equipment is being developed which possesses great range of action.

b) Achieving maximum productivity of the equipment so that in a single overflight over the reconnaissance area (in one sortie) as much information as possible will be obtained and here the equipment is being developed by increasing the coverage of the terrain and the film supply as well as by integrating the equipment.

c) Stabilizing the equipment relative to the overflown terrain and the reconnaissance objects as this is necessary to compensate for the course and pitch deviations of the reconnaissance plane and maintain conditions for obtaining information in executing energetic antiaircraft and antimissile maneuvers over objects covered by air defenses.

In recent years, particularly since the adopting of the "airland operation" in the United States, there has been a desire to integrate the reconnaissance equipment with weapons, that is, to develop so-called reconnaissance-attack complexes.

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CSO: 1801/387

ITALIAN SPADA AIRFIELD DEFENSE MISSILE SYSTEM DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 52-53

[Article by Engr-Col V. Viktorov: "The Use of the Spada Antiaircraft Missile Complex for Defending Italian Air Force Airfields"]

[Text] The military leadership of Italy which is one of the active members in the aggressive NATO bloc, along with increasing the strike power of its armed forces, is carrying out measures to improve and further strengthen various-purpose air defense systems, including for direct defense of airfields against low-flying enemy aircraft. Judging from announcements in the Western press, until recently the task of defending the Italian Air Force airfields has basically been carried out with antiaircraft artillery. However, as a result of research conducted by Italian specialists at the end of the 1970's, the defense of the most important airfields merely by antiaircraft artillery was not considered sufficiently effective and for this reason the Air Force Command took a decision to purchase short-range antiaircraft missile installations (AAMI). As a result in July 1980, a contract was signed with the Italian Selenia Firm which would provide for the delivery of five Spada short-range AAMI. The first of these was to be established at a combat position for defending Grosseto Airport at the beginning of 1983, while the other four were to be deployed at other airfields by mid-1985.

The foreign press has pointed out that the short-range, all-weather Spada AAMI is capable of hitting low flying airborne targets at ranges up to 15 km and altitudes up to 6 km with a probability of 0.8. It is felt that the installation possesses a short reaction time, a high degree of automating the firing process, great resistance to jamming and reliability.

The basic elements of the installation are the Pluto 2D, coherent-pulse detection and tracking radar, the target tracking and illuminating radar, equipment for automatic processing, displaying and transmitting of the data, the Aspide-1A antiaircraft guided missiles and six container-type loaded launchers.

In organizational terms the AAMI consists of the operational control center and the firing sections. The control center includes the Pluto radar and the automatic equipment for the processing, displaying and transmitting of data. The electronic equipment of the radar is located in a shelter and its antenna is set

up nearby. The radar which operates in the 10-cm wave band can detect aircraft of the F-104 type flying at a low altitude under conditions of interference from ground clutter at a range of at least 50 km. It uses an advanced system for processing the radar signals and a moving target selection system. The transmitter emitting power is 135 kilowatts and the antenna turning speed is 15 rpm. Simultaneously with detection, the radar is capable of tracking up to 10 targets. In the second shelter of the command post, where the equipment for the automatic processing, displaying and transmitting of data is located, there are three work areas for the operators of the combat crew. The basis of the equipment is two NDC-1700 computers which have storage units with a capacity of 32,000 words each and a word length of 18 bits. At each operator console there is a display (40 cm in diameter) on which the air situation is shown with the aid of the blips from the target and symbols, a display (18 cm) for alphanumeric information, a keyboard for inputting data into the computer as well as other control monitoring units.

The first officer monitors the so-called security zones which are designated for friendly aircraft: the distant one is the flight corridor for the approach of airplanes for landing and the near one is a sphere of 360° the center of which is over the runway.

The second operator controls the Pluto detection and tracking radar, that is, depending upon the combat situation chooses the method of countering the interference; he determines the polarization of the emitted radar signal (horizontal or circular), switches on the moving target selection mode and so forth.

The third operator is the commander of the combat crew. He is responsible for identifying the air targets, he assesses the degree of their threat, he takes the decision to fire on the most dangerous ones and allocates the targets to the firing sections, transmitting data on them to the fire control centers. The basic control processes of the Spada AAMI, starting from target detection and ending with the launching of the missile, have been fully automated. The time from the moment of detecting an air target until its identification and from the start of transmitting data to the fire control center to the launching of the antiaircraft guided missile is 10 seconds each and for this reason the total reaction time of the installation does not go over 20 seconds.

A firing section includes one control center and three 6-missile launchers of the container type. At the control center is the target tracking and illuminating radar which has two transmitters. One (operating in the 5-cm wave band) is used for tracking the target while the second (in the 3-cm band) is used for illuminating the target essential for the guidance of the antiaircraft guided missile. The radar antenna is capable of turning 360° for the azimuth and from 0 to 70° for elevation.

At the fire control center there is one place for an operator who controls the operation of the radar and the launchers, he launches the missiles, monitors their flight and assesses the firing results. When necessary an air target can be fired on by two missiles. The foreign press has pointed out that regardless of the fully automated control of firing, the work of the AAMI is constantly under the supervision of the operator and he can terminate the process of missile guidance, give a command to destroy it, if at the last moment it is discovered that the antiaircraft guided missile has been launched against a friendly aircraft.

For increasing the resistance to jamming, the radar has been coupled with a television tracking system and this is utilized by the operator of the fire control center under conditions of strong radio countermeasures.

The Spada AAMI includes the Aspide-1A antiaircraft guided missile and this is also used in the Albatross ship-based AAMI and as an air-to-air guided missile. The foreign press has given the following specifications of the missile: length 3.7 m, diameter of body 20.3 cm, wing span 0.8 m, size of stabilizing fin 0.64 m and launch weight 220 kg. The engine is solid-fuel, it weighs 54 kg, the firing time is 3.5 seconds and the total pulse is 120,000 kg/second. The rocket is equipped with a fragmentation-high explosive warhead (weight 33 kg) the detonating of which occurs with direct contact with the target or in the activating of the radar proximity fuze. Guidance to the target is carried out by a semiactive radar homing head operating in a monopulse mode.

The antiaircraft guided missile is launched from a launcher which carries six missiles in transport-launcher containers. The launcher is mounted on a trailer and can be turned 360° for the azimuth at a rate of 50°/second, and for elevation has a fixed angle equal to 30°. Reloading is carried out with the aid of a crane mounted on a truck which is used simultaneously for towing the launcher. The same vehicle can transport nine transport-launcher containers with missiles.

One operational control center can control the work of four section command centers (the latter include up to three 6-missile launchers). In this make-up the AAMI is capable of firing simultaneously on four air targets and with two missiles at each. However, as the foreign press has pointed out, depending upon the type and location of the defended airfield, the AAMI will include one operational control center and two or three firing sections located in a radius up to 10 km. It is felt that this will make it possible to better organize airfield defense, if the best positions are chosen for deploying the elements of the installation.

Although the Spada AAMI is deployed under semistationary positions all its elements are transportable. It requires 14 motor vehicles to move them, including the 48 transport-launcher containers with missiles; three of these vehicles should be equipped with cranes. The installation is also aerotransportable and can be carried by military transports of the C-130 Hercules type or CH-47 Chinook helicopters.

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CSO: 1801/387

DEVELOPMENT OF U.S. SEALIFT EQUIPMENT, PLANS REVIEWED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 55-61

[Article by Capt 1st Rank F. Gavrilov: "Maritime Transport Facilities for Supporting the Strategic Mobility of the U.S. Armed Forces"]

[Text] In intensifying preparations to start a new war which the Pentagon rulers plan to conduct in areas distant from the United States, they have paid particular attention to increasing the strategic mobility of their Armed Forces, in isolating three basic components for this: air shipments, the early stockpiling of military cargo in various regions of the world and sea shipments.

The foreign press has pointed out that air transport can effectively and rapidly ferry personnel and a limited amount of materiel over significant distances. It is also emphasized that the early stockpiling of logistical means combined with the air transporting of personnel helps to reduce the time for deploying a grouping of armed forces. Sea shipments make it possible to deliver a much larger quantity of materiel to remote theaters of war, although this requires a longer time. This is due primarily to the fact that in terms of their cargo carrying capacity ships surpass other means of transport. They are capable of carrying the most diverse cargo (including heavy and oversized, wheeled and tracked equipment, small vessels and launches, airplanes and helicopters, railroad trains) and when necessary carry out cargo handling operations on an open beach.

According to information in the foreign press, the U.S. military leadership, in planning to utilize its armed forces in large-scale military conflicts, plans to move troops and the stores for supplying them to Europe, Korea and Southwest Asia primarily by sea.

It is estimated that in the initial period of a war in Europe, it will require around 10 million tons of weapons, military equipment, supplies and material support. In organizing the delivery of such a quantity of cargo, the Western press has stated, it is essential to consider the following factors. The capabilities for air transport are limited not only by the aircraft cargo capacity (the largest of which is not comparable even with the smallest ship), but also that one ton of cargo requires six tons of fuel (from the experience of the Arab-Israeli conflict in 1973). In activating the entire fleet of military transports (77 C-5 and 234 C-141) for ferrying, for example, to Southwest Asia

the weapons, military equipment and supplies of just one mechanized division (around 100,000 tons) from the United States it would require a month, while eight high-speed container vessels could deliver this cargo in 11 days.

Leadership over the operations of American maritime transport to ensure the strategic mobility of the armed forces has been entrusted to the Military Sealift Command (MSC). Its chief tasks include: peacetime transporting of troops and material support for all the Armed Services as well as cargo of other departments upon instructions of the Defense Department; working out and realizing plans for increasing sea shipments in the event of an extraordinary situation or war and increasing the mobilizational readiness of the maritime fleet; satisfying the need for vessels used for oceanographic research, tracking missiles, weapons testing and so forth. The MSC coordinates closely with the other agencies of the Defense Department responsible for the transporting of military freight as well as with the Maritime Administration Under the Department of Transportation.

Since the end of the 1960's, the Pentagon has concentrated basic attention on the problem of delivering troops and cargo to Europe during the first 2 or 3 weeks of military operations. At that time, finances were allocated primarily for air shipments and for the program of stockpiling materiel on land. The necessity of maritime shipments to the European continent began to be felt with particular urgency in 1979-1980, when the concept of a "rapid-fire war" was considered not corresponding to the new views of American specialists as they assumed the possibility of conducting protracted military operations using conventional weapons. At the same time, the problem arose of supporting the combat operations of the "Rapid Deployment Forces" in Southwest Asia. The significant number of personnel and represented by all the Armed Services, the complexity of solving the stockpiling problem and the need for replenishing material supplies led to the necessity of the broad use of maritime shipments (considering the experience of the recent war in Vietnam).

The concept of "forward lines" is also fully based on strategic mobility; this envisages the employment of the American Armed Forces in areas very distant from the United States. The realization of the designated concept cannot be ensured without the necessary amount of maritime transports. Here the number of vessels constantly under the control of the MSC, according to a statement by its commander, is clearly insufficient for carrying out the entire range of missions. The eliminating of such a discrepancy is particularly important for conducting amphibious landing operations, since while the first landing wave is landed from special landing crafts, the delivery of the second (25 percent of the personnel and 60 percent of the material supplies designed for 45 days of combat operations) is carried out by conventional vessels.

The U.S. Navy Command, according to information in the foreign press, has recognized that sea shipments in conducting military operations, in particular in Southwest Asia, are greatly similar to the shipments carried out by Great Britain in the South Atlantic in the course of the conflict with Argentina over the Falkland (Malvinas) Islands. Here they have noted the significant length of the lines of communications (8,000 miles) and that over 70 percent of the vessels from the Royal Navy task force belonged to the maritime fleet (around one-third of them was tankers and the rest were vessels for transporting general, that is, loose and crated, cargo and equipped with onboard cargo-handling equipment).

The American legislation has recognized the necessity of sea shipments for military purposes and the availability of a developed fleet which would be capable of carrying them out. As early as 1936, the maritime navigation law provided the possibility of using American-flag vessels as auxiliary Navy ships and transports for delivering military cargo as well as the installing of special equipment making it possible to quickly refit these vessels for actions in convoys.

At present, programs are being carried out to strengthen the sea shipment facilities aimed at improving and modernizing the ships of the maritime fleet in order for them to carry out the assigned tasks in the event of mobilization. The Pentagon also views the experience of the Anglo-Argentine conflict from the viewpoint of increasing the strategic mobility of the armed forces and chiefly the "Rapid Deployment Forces." In this context definite measures are being taken to rapidly increase the maritime transport resources to ensure the transoceanic shipments of large troop contingents to any regions of the world. According to the military program for 1983-1987, the allocations for the designated purposes will increase by 25-fold in comparison with the previous 5 years and reach 6 billion dollars.

The MSC obtains the basic mass of transports from the following sources.

Vessels under the control of the MSC. These are transports belonging to the state (16 dry cargo vessels, 21 tankers, 49 scientific research and auxiliary vessels of the Navy's Mobile Rear Services) as well as chartered from private firms (30 dry cargo vessels, 21 tankers and 6 scientific research and auxiliary vessels of the Navy, of which 10 tankers are used in the system of the strategic oil reserve and 17 transports are at the forward base at Diego Garcia used as floating warehouses and 9 are undergoing a major overhaul).

According to the estimates of American specialists, up to 75 vessels could be drawn from the given source for shipments.

The reserve national defense fleet. Its ships and equipment are turned over to the MSC in the declaration of an emergency. A majority of the 170 transports (83 percent) belongs to the Victory-ship class built during World War II and mothballed at four berthing areas, two each on the West and East Coasts of the United States. Some 30 transports which are approximately 20 years old have an increased readiness (6 of them can be loaded within 5 days and 24 in 10 days). It would require 60 days to demothball the remaining 140 vessels.

Vessels of the maritime fleet flying the American flag. These would be made available to the MCS with the declaration of an emergency. At the beginning of the current year, the ship registry of the Maritime Administration of the Department of Transportation had around 570 transports owned by private companies. The administration is responsible for determining their fitness for carrying military cargo and assignment to the MSC. In the opinion of Western specialists, the vessels designed to deliver military cargo (161 dry cargo vessels and 21 tankers) will also be employed in transporting strategic raw materials for industry.

Vessels of American ship-owning companies registered under the "flags of convenience" of other states (primarily Honduras, Panama and Liberia). This provides

higher profit as a consequence of the low taxes and the absence of any labor agreements in hiring on crews. However, the foreign press has pointed out that, regardless of the significant number of such vessels, they include comparatively few fit for use under combat conditions. Moreover, the Pentagon has serious doubts as to the reliability of the given source for strengthening the MSC, as in putting these facilities under U.S. control, difficulties might arise over the "disloyalty" of their crews which are made up, as a rule, of persons from developing countries. For example, instances are known of the refusal of the crews of such vessels to take on military cargo for delivery to Vietnam as well as the decision of the Liberian government in 1973 to ban the use of merchant vessels flying the Liberian flag to transport similar cargo to the Near East. Nevertheless, Washington has not written off the transports flying "flags of convenience." American maritime legislation directly provides the government with the right to use this "effectively controllable fleet" in the event of war.

The political and military-strategic plans of the U.S. ruling circles are also reflected in the specific formation of the transport fleet under the national registry, in the stable and rapid growth of the number of universal dry cargo vessels and tankers as well as new highly productive vessels (container carriers, rollkers and lighter carriers) which are most suitable for use for miltiary purposes. The foreign press has stated that 21 lighter carriers out of the 34 vessels of this class existing in the world fly the American flag. The U.S. maritime fleet is marked by a comparatively high percentage of vessels with their own cargo-working equipment and this is related to the traditional desire to reduce as much as possible the need for shore cargo-working equipment (the development of American ports for a long time has been oriented at broadening the system of "finger" piers without stationary crane equipment).

The container carriers (a length of 198-213 m, a width of 22-29 m, a draft of 9-16 m, the number of standard containers in the 6th equivalent of 1,500-2,000, a cargo carrying capacity of 15,000-25,000 tons and a speed up to 23 knots), are incapable of taking on outsized cargo, and have an advantage over other classes of vessels in the total volume of transportable cargo (they take on larger batches of piece-crated cargo) in the greater speed of processing the cargo (loading and unloading) (by 5-8-fold) and as a result, in the turnaround speed. At present, virtually all the dry cargo vessels are being built considering the possibility of carrying containers. There are two subclasses of container carriers: with regular cargo-working equipment and without it. The latter require modern container terminals, that is, they use port cranes for loading and unloading and this, of course, to a lesser degree meets wartime requirements.

The container carriers are most suitable for carrying out the task of transporting packaged cargo of the ground forces and marines operating in distant theaters of war.

Among the basic advantages of container shipments over the traditional methods, NATO specialists put the following: the presence of an effective (in peacetime) international system of cargo transporting in containers by all types of transport, as well as a broad network of container terminals and standardized transporting and transloading equipment; the successful solution to the basic demand on shipments in the event of war namely to ensure high speed of the entire transport cycle from the moment of loading until unloading; reduced vulnerability

of shipments due to the sharp reduction in the time the ships remain in ports, the working of the cargo and its dispatch from the piers; increased protection of the cargo and the possibility of storing it outside of warehouse facilities. According to evidence in the American press, by 1985 around 85 percent of the military sea shipments will be handled by container carriers. However, these advantages are turned into a shortcoming in areas with little port equipment where only container carriers with their own cargo-working equipment can be employed.

Rollkers, that is, vessels with a horizontal loading and unloading method (the "Ro-Ro" class) have a length of 198-214 m, a beam of 28-30.5 m, a draft of 8.5-10.7 m, an average cargo-carrying capacity of 14,000 tons and an average speed up to 25 knots. They conform most fully to the demands made, as they are capable of taking on a broad assortment of cargo (general and baled as well as in containers, trailers, tracked and wheeled equipment) and unload the equipment on the pier under its own power through the side and stern doors over cargo ramps (the length of the required berth front is approximately 5-fold less in comparison with vessels of other classes). The drawback of such vessels is that for unloading them it is essential to have piling piers and mobile trestles which make it possible to deliver the equipment to an open beach.

The small number of this class of vessels has forced the American command to reequip other transports as them, and primarily the large tonnage, high-speed container carriers, for example, of the SL7 class with a cargo-carrying capacity of 28,000 tons and having a speed up to 33 knots (8 units have been refitted and another 12 are to be).

Lighter carriers (barge carriers)--the carriers of previously loaded lighters and barges--have a length of 244-267 m, a beam of 30.5-32.3 m, a draft of 7.6-9.2 m, a cargo-carrying capacity of 30,000-39,000 tons and a speed up to 22 knots.

The United States uses lighter carriers of two types: the "Lesh" which is classified among vessels with a vertical method of loading and unloading the lighters (up to 89 units with a tonnage of 370-375 tons each) using a crane which moves along the vessel and the "Seebee" on which a synchronized elevator platform is used for this purpose.

Among their merits is the possibility of delivering outsized freight and rapidly carrying out cargo handling work in the roadsteads, that is, relative independence from the port pier facilities, while among the shortcomings are the necessity of having launches which can tow the nonself-propelled barges from the vessel to the shore.

The rollker and lighter transport systems, in the opinion of the U.S. Navy Command, best meet the requirements of troop strategic mobility. They provide a high rate of cargo handling, they sharply reduce the time spent by the vessels in ports, they do not require port cargo-working equipment and increase the transport capabiilty of the vessels.

The universal dry cargo vessels (length 140-200 m, beam 18.3-24 m, draft 9-10 m, cargo-carrying capacity 9,500-16,000 tons and speed of 15-20 knots) are traditionally the most numerous class of maritime transport vessels which have always

been actively used for delivering military cargo and for carrying out other missions as naval auxiliary vessels. The NATO specialists, considering the experience gained in the course of the world and local wars and conflicts, feel that these vessels will be widely used in the future.

The merits of the dry cargo vessels consist in the ability to transport various types of material, including outsized cargo (tanks and artillery guns) and in the presence of cargo booms which make it possible to unload weapons and military equipment on the piers of poorly equipped ports. The development of the given class of vessels is occurring in the direction of broadening the possibilities of shipping standardized cargo (containers and pallets), wheeled and tracked equipment, large-sized and heavy cargo (industrial equipment and metal structural elements). Approximately one-half of these vessels is combined ones which possess the capacity of both the container carriers as well as barge carriers and rollkers. Their shortcomings are the necessity of standing by a pier and the longer loading and unloading time than the specialized vessels.

The tankers (length 213.5 m, beam 30.5 m, draft 11 m, cargo-carrying capacity 40,000 tons and speed of 18 knots), as foreign specialists feel, in addition to transporting crude oil, can be used also as supply vessels (delivering fuel to the troops which are fighting in distant theaters of war), as forward supply bases close to the combat areas, as island-type floating distribution piers, as platforms for the basing of helicopters and as floating oil storage.

After World War II there has been a tendency to build ever-larger tankers. Thus, in recent years, the tonnage of some of them has increased by 22-fold, however for many this has remained within the limits of 27,000-90,000 tons.

Considering that the real possibilities of the MSC do not fully conform to the global claims of American imperialism, the Pentagon has carried out specific measures to increase these.

The foreign press has pointed out that there are several programs under which there are plans to build or reequip tankers and floating depots with their subsequent chartering, as well as to purchase and reequip high-speed container carriers. Thus, one of the programs provides the possibility of building new vessels by firms who receive from the U.S. Navy firm obligations for long-term chartering after commissioning. In accord with the second program, vessels owned by private shipowning firms are to be refitted as rollkers and then chartered for a period up to 25 years. The result of carrying out the third program which provides for the purchasing and refitting of the SL7 type container carriers as rollkers should be a significant rise in the speed of delivery of wheeled and tracked military equipment to various regions of the world. This is considered particularly important at the initial stage of the conflict, when the shortage of cargo is most felt. According to other programs, by 1988 they plan to increase the number of vessels in the national defense reserve fleet which are in an increased state of readiness up to 77 units, to develop and purchase for the container carriers special cargo platforms (modules) for outsized cargo and to refit and purchase vessels which will be dumps for guns, military equipment and materiel for three marine expeditionary brigades and Army and Air Force units from the "Rapid Deployment Forces."

The cargo modules being developed for the container carriers will broaden the possibilities of employing this class of vessels and will turn them into universal vessels capable of transporting virtually all the military equipment of the ground forces which does not fit in standard containers. Using a portal crane these will be placed in the hold, one after another. Their height is 50 percent greater than the height of a container and for this reason as an average four modules will be placed vertically in the hold instead of six containers. Under ordinary conditions, loading is carried out by crane equipment at the stationary container terminals while unloading is done by the equipment of quickly deployed roadstead container terminals.

According to the admission of the MSC Command, the basic problem arising in the use of maritime transports is the insufficient number of vessels in the required classes and the high percentage of old vessels in the reserve national defense fleet. The Pentagon is also concerned by the fact that the container carriers under construction do not have their own cargo working equipment. The transporting of dry cargo does not represent any difficulty when the container carrier arrives in a port equipped with modern crane equipment. Things are more complicated when the weapons, equipment and materiel must be unloaded in such areas as Southwest Asia where there are few sufficiently equipped ports. On the staffs of the NATO Armed Forces, where the planning bodies are forced to consider the possibility of the knocking out of the basic European ports, they are also searching for ways to unload the vessels under difficult conditions.

According to statements in the foreign press, for increasing the possibilities of using vessels which do not have cargo-working equipment in areas where equipped ports are lacking, they are developing and testing different variations of ship transport systems for loading and unloading, the so-called, rapid-deployed roadstead container terminals. Such a system includes: lighters of various types (existing ones or under development, in particular, air cushion launches capable of operating in coastal waters on shallow depths); sectional barges which can be quickly delivered to the necessary area by sea or by air and converted into lighters, jetties, piers and platforms; metal covers for tracked and wheeled equipment; equipment which can unload tankers including equipment for pumping fuel and tanks for the storage of fuels and lubricants.

A system for unloading containers by an unloader ship. Here they envisage the temporary equipping of any vessel (or barge) with two cranes (each with a capacity of 40 tons and a boom reach of 45 m) which can be installed in 4-6 days on them. A container carrier ties up to the side of such a vessel and with the aid of the cranes containers are transloaded to lighters moored on the other side of the unloader or a mobile pier which is between the barge and the lighters. The use of such a method in the course of working out combat preparation problems has shown that unloading can be successfully carried out with an up to 2-point sea. The containers can be transloaded to the shore. The use of the given piers is significantly limited by the necessity of setting them up first in the unloading area, as the delivery of the piers requires good weather conditions and a great deal of time due to the slow towing speed. For this reason the most promising means of delivering containers to the shore is air cushion launches which possess a high speed and, consequently, turnaround time. They are capable of operating in a heavy sea and crossing ice fields and swampy terrain (the U.S. Navy should begin receiving them in the second half of the 1980's). However,

they are characterized by a low cargo-carrying capacity (just one container if the freight is sufficiently heavy), the difficulty of maintenance and high fuel consumption.

The ship unloading system includes slewing cranes (with a load-lifting capacity of 150-200 tons) mounted on tracks and moving from one hatch to the other along the centerplane of the vessel. These are to be installed on the container carriers a majority of which does not have its own crane equipment as well as on vessels in the reserve and not used in maritime navigation.

At the same time, foreign military specialists have emphasized that the unloading of the vessels close to shore solves only one-half of the logistical problem. In addition, additional equipment is required capable of delivering the cargo to the shore, that is, pontoons for seawalls, mobile piers and prefab trestles on pilings used to transload the containers from the lighters to truck trailers and subsequent transport to the shore. The pier and trestle sections are delivered to the assembly area by vessels. Thus, one lighter carrier can transport around 75 sections. It takes around 3 days to set them up. The piers are equipped with cranes and turntables for the containers and vehicles. Since the upper portion of the piers can be raised on jacks above tied level, they can be used to cross a tidal zone 1.5-2 m high between the unloading lighters and the shore.

As a highly mobile roadstead container terminal it is also possible to use the regulation Army "De Long" barges equipped with cranes. These can be transported to the destination by lighter carriers (a vessel fo the "Seebee" class can carry up to four such barges). The piers assembled form such barges are raised on supports above the wave level by a jack system and can be installed both in protected harbors as well as on an open beach.

In the opinion of specialists from the U.S. Navy, there are also additional opportunities for rapid container unloading of vessels by employing helicopters for this purpose. This methods was first tested out during the period of the American aggression in Southeast Asia. This makes it possible to carry out unloading with a heavy sea, when the use of other boats is excluded. This makes the method irreplaceable, regardless of the high cost. As has been stated in the American press, the use of helicopters for unloading vessels will be justified with rear support for troops landed on a shore in the course of landing operations, with the necessity of reducing the risk of losses by spreading out the unloading points and in transporting particularly important and low-weight cargo.

All the above-given facts show that the U.S. military-political leadership, in pursuing clearly aggressive goals in various regions of the world, has assigned a major role to the maritime transport fleet in ensuring strategic mobility of its armed forces and delivering the necessary materiel to distant theaters of war.

10272
CSO: 1801/387

MINELAYER DEVELOPMENT IN WESTERN NAVIES ANALYZED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 61-65

[Article by Capt 3d Rank V. Ovsyannikov and Capt-Lt A. Kolpakov: "Minelayers"]

[Text] The military-political leadership of the NATO countries, in accord with its militaristic plans aimed against the Soviet Union and the other socialist commonwealth countries, is constantly increasing the combat might of the navies. Among the various types of naval weapons, significant attention has been given to mining weapons.

The modern views of the naval command in the aggressive NATO bloc on the use of mining weapons in combat operations are largely based on the experience of World War II and this convincingly showed that mines are an effective and the most economic means for combat at sea. They can be employed in wars and military conflicts of any scale, including in a nulcear missile war. In preparing to widely employ mining weapons in combat operations at sea, the naval commands have allocated significant funds for the development of the carriers. A majority of the submarines, surface vessels and a number of naval aviation aircraft have been adapted for minelaying. Nor have the surface minelayers lost their importance now. It has been emphasized that they possess great mine carrying capacity and provide high precision in minelaying.

At present, the surface minelayers figure in the lists of the fleets of 8 of the 16 basic capitalist countries in an amount of 36 units. The age of a majority of them exceeds 10 years. However, minelayers age more slowly than other naval vessels and with small expenditures can be kept on the level of modern requirements.

The minelayers in the fleets are divided into two groups: those operating in areas remote from the bases and in the base areas. The ships in the first group can be built according to special plans or refitted from existing vessels. Moreover, minelayers designed to operate in distant areas can be both narrowly specialized as well as multipurpose vessels with one of the basic missions being minelaying.

At present, abroad there is a tendency to build small minelayers which are to be used for advance minelaying in their own waters. The basic tactical and technical specifications for the minelayers in the capitalist navies are given in the table.

Basic Tactical and Technical Specifications of Minelayers in the Capitalist Navies

Тип корабля (количество), год постройки	Водоизмещение полное, т	Главные размерения, м: длина / ширина / осадка	Мощность энергетической установки, л. с. / полная скорость хода, уз	Экипаж, человек	Вооружение: количество артустановок×калибр. мм / количество мин
1	2	3	4	5	6
		Great Britain			
"Ebbdale" (1), 1957	1500	80,8 / 11,7 / 3	2690 / 16	98	1 × 40 / 44
		FRG			
"Saxenwald" (2), 1969	3380	110,9 / 13,9 / 3,8	6200 / 17	62	4 × 40 / 400 — 800
		Norway			
"Vidar" (2), 1977—1978	1673	64,8 / 12 / 4	3091,2 / 15	50	2 × 40 / 300 — 400
"Borgen" (1), 1967	282	31,2 / 8 / 3,4	660 / 9	*	1 × 20 / *
		Denmark			
"Falster" (4), 1963—1964	1900	77 / 12,8 / 3,6	4800 / 17	120	4 × 76 / 400
"Lindormen" (2), 1977—1978	570	44,5 / 9,0 / 2,6	1600 / 14	27	2 × 20 / 50 — 60
"Langeland" (1), 1951	332	44 / 7,2 / 2,2	1000 / 12	34	2 × 40; 2 × 20 / *
		Turkey			
"Nusret" (1), 1964	1880	77 / 12,6 / 3,4	4800 / 18	146	4 × 76 / 400
"Marmaris" (5), 1945	1100	61,9 / 10,5 / 2,6	2880 / 12	89	4 × 40; 2 × 20 / 60
"Mehmetcik" (1), 1958	540	39,6 / 10,7 / 1,9	540 / 10	22	— / *

Note: For key, see next page.

* Two 3-tube torpedo launchers.

1	2	3	4	5	6
		Greece			
"Aktion" (2), 1945	1100	62.1 10.5 2.5	3600 12.5	65	8 × 40; 6 × 20 100 — 130
		Japan			
"Soya" (1), 1971	3050	99 15 4.2	4000 18	185	2 × 76; 2 × 20 (2 трехтрубных ТА)* 460
		Sweden			
"Karlskrona" (1), 1981	3200	105.7 15.2 4	10344 20	50	2 × 40; 2 × 57 105
"Alvsborg" (2), 1971 — 1976	2650	92.4 14.7 4	4200 15	95	3 × 40 (helic.) •
"Mul-12" — "Mul-19" (8), 1952—1956	245	31.2 7.4 3.1	460 10.5	•	1 × 40 •
"Mul-11" (1), 1946	200	30 7.2 3.6	300 10	•	2 × 20 •
"Mul-20" (4)	234	32.3 8.3 2.0	•	•	1 × 20 •

Key: 1--Class of ship (number), year built
2--Total displacement, tons
3--Main dimensions, m: length, beam, draft
4--Power of propulsion unit, hp/full speed, knots
5--Crew, men
6--Weapons: number of artillery pieces x caliber, mm/number of mines

Great Britain in its Navy has the minelayer "Ebbdale." This is a multipurpose ship designed primarily for minelaying. It can also be used as a headquarters and support ship for a minesweeper task force. The Navy Command plans to use for minelaying combat vessels which are equipped for receiving and laying mines as well as air cushion boats.

The West German Navy has two mine transports, the "Saxenwals" and "Steigerwald" built in 1969. Their range is 3,500 miles. The mines are released into the water from the stern from four tracked overboard chutes. All combat ships and launches have also been adapted for minelaying. Submarines of the 205 and 206 designs can also carry mines.

In Norway attention has been given to the development of surface vessels which can carry mining weapons. The fleet includes three minelayers (two of the "Vidar" class and one "Borgen"). The ships of the first class are used in peacetime as training vessels.

The Danish Naval Command views the mining of the Baltic Straits as one of the most important measures in the event of war. Its navy has seven minelayers. The oldest of them, the "Langeland," has been in service for 28 years. In 1963-1964, four minelayers of the "Falster" class were built and these can lay anchored and bottom mines. Three hydraulic cranes have been provided for loading them. The mines are stored on the second and third decks and are set through stern ports from the second deck. A lift has been built between the decks for delivering the mines. It has been announced that mines are set automatically using a system which provides high accuracy with any mine interval. For replacing the old minelayers, in 1978, the fleet received two ships of the "Lindormen" class. These vessels are loaded through side ports which are in the lower part of the ship.

The Turkish Navy has seven minelayers. The largest is the "Nusret." It was built in 1964 and turned over to the Turkish Navy under the American Military Assistance Program. In addition to it, the navy possesses five minelayers of the "Marmaris" class (refitted from landing craft of the LSM class) and one small ship the "Mehmetcik." The presence of a significant number of such ships in the Turkish Navy are linked by foreign specialists to the fact that they are designed to seal off the Black Sea Straits in the event of war.

Greece has two minelayers, the "Aktion" and "Amvrakia," with a range of 3,000 miles.

At present, the ruling circles of Japan, in giving great attention to strengthening the naval forces, are emphasizing the construction of new ships using their own designs and equipping them with modern weapons. At the end of 1972, the minelayer "Soya" was commissioned and this was designed to lay mines, to support the combat operations of minesweepers in remote areas from the bases and carry out the functions of a command ship. The foreign press has stated that it is equipped with an automatic minelaying system following a set program at various speeds and with any mine intervals. The mines are set from stern chutes through three ports with mechanical devices. The ship has a helicopter pad, a hydraulic crane, a fiberglass boat, the necessary set of equipment and quarters for supporting the activities of frogmen as well as several sets of sweeps. As a command ship, it is equipped with a combat information center, communications and navigation equipment and there are also quarters for the housing and work of a staff.

The Japanese parliament has approved the allocating of funds for building the next minelayer which is twice the size. From the combat ships of the Japanese Navy, mines can be laid by the 50 destroyers and frigates. The increased attention to such ships in this nation derives from its obligations to the American militarists to seal off the international straits in the Sea of Japan in the event of war.

The significant ruggedness of the Swedish coast and the presence of a large amount of islands, narrows and straits as well as the shallow depths of the Baltic Sea, in the opinion of foreign specialists, have created favorable conditions for the use of mining weapons. In this regard, the Navy Command has given particular attention to the development of their carriers. At present, the minesweeping forces of the Swedish Navy include 16 minelayers, including

8 of the "Mul" class built in the 1950's and 4 in the 1980's. They carry several-score mines.

The most advanced are two minelayers of the "Alvsborg" class built in 1971-1976 at the Navy Yard in Karlskrona. In peacetime they are used as submarine support ships or as target ships for training torpedo firing. In terms of design the "Alvsborg" is reminiscent of a modern ferry boat. The upper (crew) and main (mining) decks are continuous. Below the main deck the ship's hull is divided by crossbulkheads into 12 watertight compartments. All the bulkheads are made from corrugated steel. The side cladding to avoid damage in the event of a hit by torpedos, has been additionally reinforced below the waterline.

The mines are loaded on the ship through two side ports with tracked guides which are on the level of the mine deck or using a 5-ton crane through the cargo hatches in the stern and are kept in special mine rooms. They are set through side ports in the stern. The electronic equipment controls the setting process in such a manner that while one mine is on the guides of one side, the second is already falling in the water from the guides of the other side.

The main propulsion unit of the minelayer is a single-shaft diesel with a drive to a variable-pitch propellor. This is controlled from the bridge or directly from the engine room. Three diesel generators with a total power of 1,800 kw supply the general ship requirements and can supply power for five boats at the side. The ship can be moored to a pier at the side and stern and its draft and trim adjusted using ballast tanks depending upon the height of the berth. The crew quarters are designed for 302 men. There is a launcher for firing illuminating rockets.

In 1982, the minelayer "Karlskrona" was commissioned and this is presently being used for training purposes. It has 185 training places and a helicopter landing pad.

The Swedish Navy for minelaying close to its shore also has 16 small minelayers (a displacement of 15 tons, a speed of 14 knots and can carry up to 12 small anchored mines). All the Swedish frigates and destroyers have minelaying equipment. They plan to refit the destroyers of the "Astergotland" class as minelayers.

The U.S. Navy Command views aviation as the basic setter of active minefields. In the second half of the 1970's, the B-52D planes of strategic aviation repeatedly worked on operations to lay mines in remote areas of the world's ocean. In flights of several thousand kilometers, the B-52D bomber can carry 18 Mk60 torpedo mines ("Captor"). Western military specialists feel that this amount is sufficient for creating antisubmarine barriers more than 30 km long. The carrier-launched assault planes of the A-6 Intruder and A-7 Corsair types and the shore-based patrol aircraft P-3C Orion can also be used for minelaying.

The Lockheed firm is developing a system for laying naval mines from transport aircraft having a cargo hatch in the tail of the fuselage. This is a platform with a remote hydraulic drive which is located in the aircraft's cargo compartment. On it a container is installed with the mines and a device for their forced ejection. They plan to use this system to outfit the military transports

of the C-5 Galaxy, C-130 Hercules and C-141 Starlifter types. The C-130 aircraft can carry 36 mines of the "Quickstrike" class and a C-5 can carry 132 mines.

Minelaying employing carrier-launched aviation has been repeatedly worked on in the course of exercises of the NATO navies and was carried out also during the U.S. aggression in Vietnam. The American and English aircraft carriers have special rooms for storing naval mines and equipment for loading them on airplanes.

The Western press has stated that the command of the NATO bloc in the event of emergency circumstances is planning to refit car and rail ferries as minelayers as well as "Ro-Ro" class vessels. Fishing vessels are also to be used for advance minelaying. It is felt that at times these can carry out minelaying more covertly than submarines. For these purposes they also plan to use vessels with dynamic support principles. In the opinion of foreign military specialists, air cushion minelayers can operate in a coastal zone with a rugged shoreline as well as in areas with a difficult navigational situation.

The nations having modern minelayers in their navies build them according to their own plans and this has been caused by the particular features of employing these ships. The foreign press has pointed out also that the minelayers have ineffective armament.

Judging from materials in the foreign press, in the future they intend to work out special modules with equipment for minelaying and these can be installed on any ships and vessels. However, for now they are continuing to build multipurpose ships which in wartime can be used for minelaying.

10272
CSO: 1801/387

DEVELOPMENT OF ROYAL NAVY EARLY WARNING HELICOPTER TRACED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 65-67

[Article by Col (Res) I. Kutsev: "An English Ship-Based Early Warning Helicopter"]

[Text] After the Anglo-Argentine conflict over the Falkland Islands, the English press, along with praising articles extolling the might of its Navy, has published materials reflecting the views of military specialists on certain negative aspects permitted by the command in the Navy and Air Force preparatory plans. In particular, it has been asserted that the English ships were unprotected against attacks by Argentine Air Force aircraft operating at low altitudes. The carrier groups of the Royal Navy and the individual ships outside the range of the shore-based early warning aircraft of the Royal Air Force or without such aircraft, were without early warning radars which could have promptly detected the enemy attack aircraft. The radars of the Sea Harrier-FRS.1 vertical take-off and landing aircraft could not spot low-flying targets. The specialists have explained the loss of the two English destroyers of the "Sheffield" and "Coventry" classes by this as these were attacked by the Exocet antiship missiles launched from the Super Etendard aircraft.

For establishing the need to have operational groups of mobile early warning and command facilities on the ships, the foreign press has given the following descriptions of the capabilities of modern attack planes and ship-based equipment for detecting them.

In assuming that the minimum flight altitude above the sea level, with the approach of the attack aircraft to the ship, is 30 m, in locating the antennas of the ship radars at an altitude of 15-25 m, it would be detected at a distance of around 40 km. The speed of the closing of modern attack planes with a target is 900 km an hour (15 km a minute) while for a FB-111 bomber, the Tornado tactical fighter and the Exocet missile it is around 1,100 km an hour (18.5 km per minute). The radar antenna scans with a frequency of 6 revolutions a minute and for isolating the desired signal it must make three or four scans, that is, 30-40 seconds will pass. Over this time the attack plane will come 7.5-10 km closer to the target. Thus, the attacking aircraft will have to cover around 30 km before meeting the target and this will take just 2 minutes. During this time, the crew of the attacked ship must initiate measures for electronic or other neutralization or attempt to destroy the aircraft.

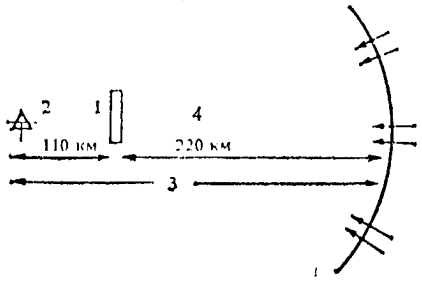

Fig. 1. Diagram of patrolling of early warning helicopter: 1--Patrolling area; 2--Ship task force; 3--Total time to repel attack (18 minutes); 4--Radar early warning zone.

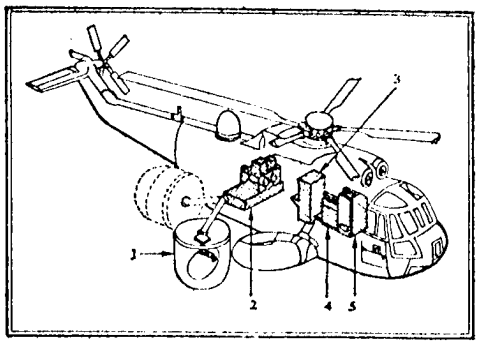

Fig. 2. Diagram of Sea King-HAEW.2 early warming helicopter: 1--Radar antenna in protective dome; 2--Radar transmitter and receiver; 3--Operator control console; 4--Cooling system; 5--Signal processing equipment.

In the near future, as foreign specialists assume, it will not be possible to increase the detection range of low-flying air targets by improving the ship radars, as this is limited by the radar horizon. But it is possible to reduce their detection time by increasing the rotation speed of the radar antenna and improve the signal processing equipment. However, the enemy can easily compensate for this shortening of time by increasing the speed of flight of the attacking aircraft and guided missiles.

It is felt that the given problem can be solved by basing on light carriers and ships special early warning aircraft and helicopters. For this purpose the United States uses the carrier-based E-2C Hawkeye early warning aircraft which, because of its heavy weight, cannot be carried on English aircraft carriers. The use of a ship-based early warning helicopter, as is shown in Fig. 1, will make it possible to increase the time for repelling the attack.

Considering all of this, the Royal Navy Command, even on the eve of the conflict in the South Atlantic, having urgently reviewed a number of plans, decided to use the Sea King-HAS.2 ASW helicopter as a ship-based early warning system, having equipped it with a Searchwater radar. In May 1982, the tactical and technical requirements were worked out for the helicopter which was designated the Sea King-HAEW.2 (HAEW--Helicopter Airborne Early Warning).

The modernization of two helicopters was started at the beginning of June 1982. The sonar set was removed from the ASW equipment. In its place they installed a radar which is a modernized version of the radar from the English Nimrod-MR2 shore-based patrol aircraft. On the console of the tactical situation operator are three displays: the plan position indicator (oriented to the north and stabilized relative to the earth), "range--azimuth" and "range." The antenna is located outside on the righthand side of the helicopter fuselage on a turning bracket (Fig. 2) in a protective dome which during operation is filled with compressed air with an overpressure of 0.035 kg/cm^2. During take-off, landing and in a nonworking state, the air is let out of the dome and the bracket on a hinge

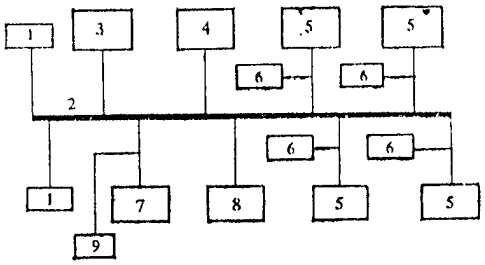

Fig. 3. Schematic diagram for onboard equipment of future early warning radar helicopter: 1--Monitor of information wire; 2--Information wire; 3--Radar; 4--Communications equipment; 5--Display; 6--Microprocessor or minicomputer; 7--Electronic reconnaissance equipment; 8--Navigation system; 9--Data bank of system for electronic reconnaissance on enemy targets.

is turned 90° to the rear with a hydraulic drive. In a working position the antenna is below the fuselage lines and provides all-round viewing. The diameter and length of the dome is 1.8 m, the weight of the radar is 545 kg, and the time required to move it to a working position is 14 seconds. This flight was made on 31 July. The helicopters were tested on a carrier which from 27 August through 21 October 1982 was in the area of the Falkland Islands.

At a maximum flying altitude (3,000 m) the radar detection range for air targets reached 230 km. The length of patrolling with a four-man crew was 4-4.5 hours.

At present Great Britain and Italy are jointly developing a new ASW helicopter, the EH-101, which possibly will also be used in a ship-based early warning model with an all-round looking radar mounted below the fuselage nose. The first flight of the experimental model of the helicopter has been planned for 1985-1986. Moreover, the Royal Navy Command is planning to examine the prospects of employing versions of the Sea Harrier aircraft and the experimental XV-15 aircraft with swiveling engines in the ship-based early warning systems.

As a whole, in the opinion of the Western military experts, the ship-based early warning helicopter, in contrast to an airplane, has a limited lift-off weight and internal fuselage space, and nevertheless its special equipment should include five basic elements: the early warning radar, the identification system, electronic reconnaissance equipment, equipment for processing and displaying the data, as well as more advanced navigation and communications equipment. A schematic diagram of the onboard equipment for the future early warning helicopter is shown in Fig. 3.

Foreign specialists feel that the radar must provide all-round looking (360°), since with sector scanning a helicopter would be forced to remain at one point, that is, to hover or fly forward at a slow speed. This causes high fuel consumption and significantly shortens the length of patrolling. In order to constantly observe an area where the enemy may appear, the helicopter should fly a loop-like route. However, during a turn conditions may occur whereby the attacking aircraft would break through unnoticed to the ship.

Out of tactical considerations and according to the existing technical capabilities, a radar should detect airborne targets with an effective diffusing surface (EDS) of 5 m^2 at a range of at least 185 km. Such a radar could detect targets also with a smaller EDS at adequate distances for promptly alerting the air defense system and the shore-based patrol aircraft a great distance away. A pulse-Doppler radar should isolate a target in the lower hemisphere against the background of the surface of a stormy sea or ground, possess high resistance to

jamming against electronic suppression equipment and operate dependably under the conditions of the anomalous propagation of radio waves. For this it is essential to have on the helicopter special equipment made by the Ferranti Firm which analyzes such propagation conditions.

The early warning helicopter should be equipped with electronic reconnaissance equipment, since this will make it possible from the parameters of the radar signals to detect the enemy radar more accurately than a radar designed to identify an aircraft.

It is felt that the data processing and display equipment will make it possible for the helicopter crew to see the full picture of the combat situation in the zone of the task force. Centralized control envisages the transmitting of information from the helicopter to the ship. This problem can be resolved by a reliable broad-band high-speed radio link. It is felt that such radio links presently do not exist for transmitting information from the helicopter to the ship as they are subject to the effect of radio interference. In the opinion of foreign specialists, even the promising high-frequency data transmission line of the Joint Tactical Information Distribution System, or JITIDS, will still be vulnerable due to the anomalous propagation of short-wave radio waves at frequencies over 100 megahertz. At present, articles are appearing in the foreign press on the turning over in the future of the air defense weapons control functions from the ship command center to the early warming helicopter. In this instance the fighters flying out to intercept the attacking planes at a low altitude, in leaving the "ship--fighter" zone will be in the "helicopter--fighter" radio visibility zone and will be guided from the helicopter. Actually the early warning helicopter in terms of its functions should be analogous to such aircraft AWACS systems as the E-3A (United States) and Nimrod-AEW.3 (Great Britain), although its capabilities are also limited.

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CSO: 1801/387

SEAPORTS OF THE ARABIAN PENINSULA DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 68-74

[Article by Capt 2d Rank A. Kalgin: "Seaports of the Countries of the Arabian Peninsula"]

[Text] The Arabian Peninsula, where eight Arab states are located, is the largest in Asia. In the west it is bordered by the Red Sea, in the south by the Gulf of Aden and the Arabian Sea, in the east the Gulf of Oman and Persian Gulf.

The area of the peninsula is around 3 million km^2 and the population over 10 million persons. A majority of the population is Arabs with numerous nomadic Bedouin tribes and the dominant language is Arabic.

The development of navigation has long been favored by the good geographic position of the countries located here, by the great dependence of their economy upon the importing of various goods (equipment, metal, machinery and food) as well as the exporting of a significant amount of oil and oil products. The shores of the peninsula are not rugged, the most rugged is the coast of the Persian Gulf, however the presence of numerous small islands, shoals and coral reefs makes them inaccessible for vessels and ships; approaches to the coast are suitable only in the areas of ports. The main wealth of the region is oil and the explored reserves of this are more than 36 billion tons.

Maritime transport of the Arab states on the Arabian Peninsula, where there are virtually no other ways for exporting oil, plays a particularly important role and it is responsible for up to 90 percent of all shipments. For this reason, particular attention has been given to improving and developing the port systems, new ports are being built and the existing ones reconstructed. Since mid-1976, everywhere there has been an intense process of containerization of sea shipments and as a result of this, the nature of the port equipment has changed radically, the capacity has increased and the overloading has been reduced. According to information in the foreign press, in 1982, as a whole all the seaports of the Arabian Peninsula had more than 500 piers which were capable of processing more than 550 million tons of freight and oil. Subsequently, the total number of piers should almost double.

The construction and reconstruction of the seaports (there are over 40 of them in the Arab countries of the region) are being carried out considering both the use of the national naval forces as well as the possible basing there of combat ships and auxiliary vessels from the navies of the United States and the other NATO countries. The militaristic circles of the bloc, in providing aid to the reactionary Arab regimes, are pursuing primairly their own selfish goals. Thus, the Pentagon intends to use the territory of the New Eastern countries, and chiefly the naval bases and ports of the Arabian Peninsula, in the interests of the newly established Central Command of the U.S. Armed Forces (CENTCOM) designed for conducting aggressive actions by American imperialism in this strategically important region.

As Western specialists feel, the existing ports and naval bases in the Arab countries of the Arabian Peninsula, if one considers their location, approaches, depths, pier and navigation equipment, make it possible for various ships and vessels to enter, anchor and take shelter in them, including cruisers and large landing vessels. Virtually all the ports provide fresh water, food, fuel, and can carry out minor and to a slight degree medium repairs on ships and vessels. However, under the emergency conditions, with the sealing off of the Strait of Hormuz and Bab-el-Mandeb, navigation in this region will be sharply curtailed and a portion of the ports will be virtually closed. In this regard, the American command has given great importance to the development and use of ports, primarily in Oman and the United Arab Emirates (UAE) which have a direct access to the Indian Ocean.

At present, the ports and bases under construction and reconstruction are being equipped with modern navigation and cargo-handling equipment, the length of the berths is increasing, dredging work is being carried out, and conditions are being established for dependable defense and quick dispersion of the ships and vessels as well as for providing various types of material supply and recreation for personnel. Below information is given on the main ports and naval bases of certain countries of the Arabian Peninsula as compiled from materials in the foreign press.

Saudi Arabia, with a shoreline around 2,500 km long, in accord with the program adopted for 1981-1985, is endeavoring to continue the development of maritime transport and the port system. The nation has more than 10 ports with a total annual cargo turnover of over 190 million tons of various cargo and oil, as well as more than 50 million containers. By 1985, cargo turnover should increase to 250 million tons. The most important ports are Jiddah, Dammam, Qizan, Ra's al Juayma, Ra's al Mish'ab, Ra's al Ghar, Ra's at Tannurah, Ra's al Khafji, Al Jubayl, Al Khubar and Yanbu al Bakhr. These are responsible for more than 90 percent of all the nation's goods, oil and oil products transported by sea. In addition, a portion of the vessels can unload in the roadsteads of ports where there are more than 120 specially equipped anchorages (by 1985, their number should rise to 145).

Jiddah (coordinates: 21° 28' N. lat., 39° 10' E. long.) is the largest merchant and passenger port on the Red Seacoast and is considered the main sea gateway to Saudi Arabia. It serves the enormous territory within the country. The port is used for the basing of ships and launches as well as for transporting pilgrims

to Mecca. The basic imported goods include: cement, construction lumber, building materials, steel, grain, livestock, equipment, motor vehicles, food and industrial goods. Chiefly oil and oil products are exported.

The port area is around 154 hectares. A channel 180 m wide and up to 12 m deep is used for entry into it. The harbor is divided into two roads (inner and outer). There are 45 berths with a total length up to 9 km and depths by the walls to 14 m. A portion of these is used for handling container carriers and "Ro-Ro" class transports. Pipelines have been built from the oil tank farms to the tanker berths. On the territory of the port around 50 warehouse buildings (warehouse area of 293,000 m^2) have been built and areas have been built for open storage of freight (1,804,000 m^2). The capacity of the grain elevators and storage containers is over 120,000 tons. Around 110 stationary and mobile trains with a load-lifting capacity of 10-100 tons are provided for cargo-handling work.

The port development program envisages an increase in the number of berths, the widening of the channel to 300 m and the deepening of it to 16 m, the equipping with navigation aids and providing traffic in both directions, as well as an increase in the port's cargo turnover to 20 million tons a year (presently 12 million tons).

Dammam (coordinates: 26° 30' N. lat., 50° 12' E. long.) was built on a man-made island in the Persian Gulf which is connected with the continent by a jetty 12 km long. A highway and railroad have been built along it. The entrance to the harbor divided into three areas (eastern, western and the small boat harbor) is carried out through a channel 7 km long with depths to 14 m.

The port has 38 berths, the total length of the pier front is around 9 km, including 1.6 km for small boats. The depth along the main berths is 9-14 m and to 6 m at the small vessel berths.

Cargo-handling operations are carried out using 110 cranes of varying capacity. Repair facilities make it possible to make minor repairs on ship equipment. On the port's territory 30 warehouse building have been built (with a total area of 171,000 m^2), open areas have been prepared for the storage of cargo (2,655,000 m^2), and there is a radio communications center. The main cargo is cement, grain, construction lumber, containers, metal, equipment, and consumer goods. The annual cargo turnover of the port is 15 million tons.

Qizan (coordinates: 16° 54' N. lat., 42° 32' E. long.) is located on the Red Sea coast. It is also used for a base of the nation's naval launches. The length of the pier front is over 2,340 m and the depth by the walls is up to 12 m. Cargo turnover is around 1 million tons. Ocean-going vessels, as a rule, tie up at anchor moorings equipped 3 miles from shore and they are unloaded using lighters. On the port's territory are storage facilities (with a total area of 12,000 m^2) and open areas (140,000 m^2). In accord with the development program, new berths and warehouses are being built for transit freight and dredging work is being carried out.

The Ra's al Juayma oil terminal (coordinates: 26° 56' N. lat., 50° 2' E. long.) was built in the Persian Gulf and has five roadstead berths 12 km to sea to which

oil lines have been brought. The depths around the berths are up to 30 m and can handle tankers with a dead weight to 750,000 tons.

Ra's al Mish'ab (coordinates: 28° 12' N. lat., 48° 37' E. long.) was built close to the frontier with Kuwait and is a man-made island 1.5 km from the coast. The port is connected with the shore by a causeway over which a road has been built. Through it pass cargo basically designed for the construction of military and military-industrial projects in the northeastern regions of Saudi Arabia. On the port's territory which occupies an area of around 10 km^2, eight berths have been prepared with an overall length up to 2.5 km and depths by the walls of 4.5-6 m. Unloading work is carried out using six mobile cranes. The annual cargo turnover is 0.5 million tons.

Ra's al Ghar (coordinates: 26° 52' N. lat., 49° 50' E. long.) is located in the Persian Gulf 150 km to the north of the Port of Dammam. Here there are six pontoon piers (up to 2,000 m long) erected 4 km from the coast and connected with the continent by a causeway bridge. The port can handle simultaneously six small-tonnage vessels. In the port there are ten drydocks including two floating ones. Its total capacity is over 500,000 tons of cargo a year. In accord with the reconstruction underway at present, they plan to increase the length of the pier front by building a floating pier.

Ra's at Tannurah (coordinates: 26° 37' N. lat., 50° 10' E. long.) is considered the main oil exporting port of the nation in the Persian Gulf. The approaches to it are made through a canal the depths of which reach 21 m. For the mooring of tankers and other vessels around 20 berths have been prepared (the total length is over 8,550 m) and ten mooring cans. The depths by the piers are from 9.9 to 25.9 m. Ship repair facilities can carry out only minor repairs on the vessels. Moreover, some 32 km to the northeast of Ra's at Tannurah, an oil tanker terminal has been built and this has five places for the mooring of tankers with a displacement of up to 750,000 tons. Oil tank farms have been built on the port's territory. The cargo turnover is more than 55 million tons o oil a year.

Ra's al Khafji (coordinates: 28° 25' N. lat., 48° 35' E. long.) is designed for loading oil, oil products and liquified gas. It possesses four deepwater terminals with depths by the wall to 20 m and the length of the pier front is around 0.8 km. On the port's territory they have built fuel warehouses for receiving oil and other oil products. The port's annual cargo turnover is 18 million tons.

Al Jubayl (coordinates: 27° 2' N. lat., 49° 41' E. long.) is a port complex and basic naval base of Saudi Arabia in the Persian Gulf. It is designed to handle general cargo and liquid products. The annual cargo turnover is 11.5 million tons. Here there are more than 30 berths with a length of around 9,000 m and depths by the walls to 14 m. Storage facilities have been prepared (a total area of up to 150,000 m^2) and open areas for storing cargo (over 1,352,000 m^2). Modern cargo-working equipment has been installed. For carrying out container operations they use three berths, and for handling liquid cargo, four berths with a total length of 2,400 m. These extend far into the open sea where the depths reach 30 m. Vessels enter the port area along a canal 9 m deep. At present, as the foreign press has stated, work is being done to expand the port, roads and

pipelines are being built for transporting oil and the canal is being deepened to 14 m.

Al Khubar (coordinates: 26° 10' N. lat., 50° 12' E. long.) is located in the Persian Gulf 32 km to the southeast of the Port of Dammam and is designed to basically handle ferry boats, coastal shipping and transports of the "Ro-Ro" class. In addition, it is also used for the nation's Navy. Here there is only one berth 350 m long, but by the end of 1984, they plan to build another three with a total length of 640 m and depths by the wall up to 9 m, as well as warehouses and other port equipment. The annual cargo turnover is 0.5 million tons.

Yanbu al Bakhr (Yanbo, coordinates: 24° 5' N. lat., 38° 3' E. long.) is on the Red Sea coast 365 km to the north of the Port of Jiddah. It is designed not only to relieve the Port of Jiddah but also handle the ever-increasing export operations for transloading oil and gas. The channel leading into the harbor is 1.8 km long, up to 130 m wide and over 10 m deep. The port is connected by a road to the national road network and an airfield is located not far from it. Nine berths have been built with a total length of around 2,000 m and depths of 10-12 m by the wall; here they have also built warehousing (with a total area of up to 43,000 m^2) and open areas for cargo (over 460,000 m^2). Cargo-handling operating are basically carried out with mobile trains. Minor ship repairs are possible. The cargo turnover is over 3 million tons a year.

The port system of Saudi Arabia, in the opinion of foreign specialists, has a number of substantial shortcomings. In particular, these include the poor repair facilities and the lack of skilled ship repair specialists, poor navigation support, an insufficient amount of drinking and industrial water, a complex system for the approaching of the ports by the vessels and the need to constantly maintain the normal channel and harbor depth. In addition, it is felt that the warehouse facilities and cargo-working equipment need modernization.

The Sultanate of Oman, on its coast around 1,700 km long, has three basic ports: Mina Kabus (Gulf of Matrakh), Mina al Fahal and Mina Raysut (Salalah).

Mina Kabus (coordinates: 23° 37' N. lat., 58° 35' E. long.) is located in the western part of the Gulf of Matrakh 6 km to the northeast of Muscat and is designed to serve dry cargo vessels as well as being used for the Navy. It is connected by roads with the national road network. It has a broad and deep channel which provides for the convenient entry and exiting of the vessels (not more than 150 m long) at any time of the day. In the port, 12 berths have been built with a length of 2,207 m with depths up to 10 m by the walls as well as two berths with depths to 4.2 m. They are all equipped with warehouse facilities and cranes. Here they can handle transports of the "Ro-Ro" class and container vessels as well as minor repairs on deck equipment and engines. There are plans to build another several piers and cargo warehouses. The annual capacity of the port is more than 2 million tons.

Three km to the east of Muscat lies a base of the national navies which periodically is employed by ships from other countries. It has berths with a total length of over 230 m. On the shore they have built storage facilities, administrative and service buildings as well as a helicopter landing pad.

Mina al Fahal (23° 40' N. lat., 58° 30' E. long.) has an offshore oil terminal with three mooring platforms (roadstead berths) to which pipelines have been built. The maximum depth near them is 20 m. The port can simultaneously handle three tankers with a dead weight up to 550,000 tons. The annual cargo turnover is 20 million tons.

Mina Raysut (16° 56' N. lat., 54° 1' E. long.) is located 20 km to the south of Salalah and is used by national naval boats. Here there are two seawalls which are respectively 1,398 and 1,145 m long. The length of the pier line is around 1,720 m with depths by the walls of 3-10 m. Covered storage facilities with a total area of 30,000 m^2 have been built by the berths and there are areas for the open storage of cargo of 200,000 m^2; ten cranes have also been installed. The capacity of the port should rise to 1 million tons of cargo a year (presently 0.8 million tons).

The Western press has pointed out that in the regions of Al Khasab (in the northern part of the nation on the Musandam Peninsula) and Sur (140 km to the southeast of Muscat) work is underway to build new ports which are to be used by the national naval forces and the U.S. Navy.

In Bahrain, two large ports have been built for handling commercial cargo: Manama (Mina-Sulman) and Sitra.

Manama (26° 12' N. lat., 50° 37' E. long.) is a port and at the same time a well equipped naval base where American ships call periodically. Entrance into the port from the sea is carried out through a canal 9.15 m deep and also serving as a channel to the Port of Sitra and the shipyards. In the port they have built 16 piers with a total length of 2,000 m and depths by the walls of 11.5 m. The piers provide for the unloading simultaneously of container carriers and transports of the "Ro-Ro" class. The vessels can also refuel here. All cargo-working operations are basically carried out with mobile cranes. The annual cargo turnover of the port is 2 tons. The long-range plan for its development envisages the construction of additional piers, dredging work and the building of a new channel for handling boats 300 m long.

Sitra (26° 10' N. lat., 50° 40' E. long.) is the main oil-exporting port of the nation and was built in the Persian Gulf on a small island which is connected by a causeway to a larger island located 10 km from Manama. The total length of the nine piers is over 2,000 m, and the depths by the walls are from 14.8 to 15.4 m. Over the causeway a conveyor has been built for transporting cargo from the pier to the storage facilities on the island. The approach to the port is carried out via a channel 11.58 m deep. There are rather good ship repair facilities making it possible to repair hulls and ship engines. The capacity of the port is more than 11 million tons of oil a year.

In Qatar there are two major ports for handling commercial freight (Doha and Umm Said) and these are located in the Persian Gulf on the east coast of the peninsula as well as an oil terminal on Halul Island.

Doha (25° 17' N. lat., 51° 33' E. long.) is the main maritime port and naval base of the country. The port facilities are concentrated on a man-made island connected with the mainland by a double causeway 780 m long. Vessels not more

than 180 m long, up to 24 m broad and with a draft of 8.4 m can enter the port through an 8-km channel with a minimal depth of 9.15 m. The length of the nine berths is 1,700 m and the depth by the walls is 7.5-9.1 m. Construction is underway on another two piers. For small vessels there are piers with a length of around 1,000 m (wall depth from 2.5 to 6 m). Transports of the "Ro-Ro" class can also be handled. On the piers they have built covered storage facilities with a total area of 47,000 m^2 and open areas for cargo (270,000 m^2) as well as a refrigerated warehouse. The port can perform minor repairs on ship equipment. In addition, there are also shops to repair communications and navigation equipment.

Umm Said (24° 54' N. lat., 51° 34' E. long.) is the main petroleum exporting port of Qatar and is located 40 km to the south of Doha. It is divided into three areas: an oil terminal with two roadstead berths capable of taking two tankers each with a dead weight of 300,000 tons; a pier for loading liquified gas; two deepwater piers for dry cargo vessels. Entry into the port is carried out by a channel with depths of 11.25 m. The total pier length is around 2,600 m with wall depths to 15.5 m. On the piers are covered storage areas (an area of 14,000 m^2) and open areas (180,000 m^2). The annual cargo turnover of the port is 12 million tons.

The oil terminal on Halul Island (25° 39' N. lat., 52° 25' E. long.) has two roadstead berths (maximum depth 30.5 m) and is capable of handling tankers of 550,000 tons. The annual cargo turnover is 15 million tons.

The United Arab Emirates (shoreline of 780 km) have a significant number of large maritime ports. The most important of these are Mina Rashid (Dibay or Dubay), Mina Zayyed (Abu Dhabi), Jebel Ali, Khor Fakkan and Mina Khaled (Sharja), Mina Saqr (Ras el Khaymah) and Jebel Dhanna.

Mina Rashid (25° 16' N. lat., 55° 16' E. long.) was reconstructed in 1980. The port area is limited by two seawalls 2,200 and 2,290 m long and has only one channel (narrow). For vessels 39 berths have been prepared with depths by the walls of 9.4-13 m and the total length of the pier front is 6,773 m. For handling tankers there is a pier 255 m long (11.1 m deep) and an oil pipeline (pipeline diameter 30 cm) has been built to it. All the piers are equipped with cargo-handling mechanisms. The warehouses occupy an area of 450,000 m^2. Construction of a drydock has been completed making it possible to repair vessels with a displacement tonnage of up to 100,000 tons. Annual cargo turnover is 10 million tons.

Mina Zayyed (24° 33' N. lat., 54° 20' E. long.) is considered the second most important port in the nation and is used for the navy. It is located in a natural and well-protected bay. The width of the channel is 153 m and the depth is 9.75 m. The total pier length is around 5,000 m with depths from 5 to 11.5 m by the walls. There are 31 cranes with varying cargo capacity. Minor ship repairs are possible in the port. After completing all reconstruction projects the capacity of the port should be increased up to 8 million tons (presently 2 million tons).

Jebel Ali (25° 1' N. lat., 55° 2' E. long.) is located 30 km to the southeast of Dibay. It is one of the newest and most modern ports in the Persian Gulf.

Construction was commenced in 1976 and is presently in the concluding stage. A channel has been dug 16 km long, 235 m wide with depths to 16 m. In the port there are 66 berths which are designed to receive vessels with a displacement tonnage of over 150,000 tons and to handle dry cargo vessels, container carriers and "Ro-Ro" class transports. The capacity of the port should rise to 30 million tons a year.

Khor Fakkan (25° 21' N. lat., 56° 22' E. long.) is 161 km from the Strait of Hormuz in a natural deepwater harbor on the coast of the Emirate of Sharja. In the port they have established a specialized center for handling containers and processing transports of the "Ro-Ro" class. The length of the pier line is 505 m and depths by the walls are 12 m. There is a direct outlet into the Indian Ocean. The capacity of the port is 1.8 million tons of cargo and up to 15,000 containers a year.

Mina Khaled (25° 22' N. lat., 55° 22' E. long.) is designed chiefly for container operations. It is located in a natural, well-protected and deepwater bay. The length of the piers is over 3,300 m and the depths by the walls are 10.06 m. There are two floating cranes and a fuel and lubricant storage area. The area of open storage for cargo is 155,000 m^2. The port can carry out minor repairs on the equipment of seagoing vessels. The development plan envisages the construction of 11 deepwater berths with a total length of 2,050 m. Cargo turnover of the port is 3 million tons a year.

Mina Saqr (25° 58' N. lat., 56° 3' E. long.) is 22 km to the north of Ras el Khaymah and is a modern port the construction of which is still not complete. There are seven piers and another two are under construction for cargo vessels and container ships. The total length of the pier line is 1,488 m and depths by the walls are 11.5 m. The port is equipped with modern cargo-working equipment. Minor repairs on vessels are possible. Covered warehousing has been built and a fuel depot and bunkers are under construction. The capacity is 1 million tons of cargo a year and this should rise to 2.5 million tons.

Jebel Dhanna (24° 11' N. lat., 52° 37' E. long.) is an oil exporting port which has four roadstead berths some 5.6 km offshore (depths to 18.3 m). It is capable of receiving tankers with a dead weight tonnage to 300,000 tons. Annual cargo turnover is 38 million tons.

In addition, judging from information in the Western press, the United Arab Emirates also have a small port of Qumm al Qaywayn and the areas of Fatekh, Fujeyr, Ajman, Mubarek (Sharja), Abu al Bukhush and on the islands of Das, Delma and Mubarras. By 1985, the UAE should build a number of new berths as a result of which the volume of cargo handling in the nation will increase by 4-fold.

Kuwait which is bordered by the Persian Gulf has a shoreline 195 km long. Here are located five ports: Al Kuwayt (Shuwaykh), Shuayba, Mina al Ahmadi, Mina Abdallakh and Mina Saud.

Al Kuwayt (29° 21' N. lat., 47° 56' E. long.) is the main maritime port and naval base of the nation. It has 36 piers with a total length of over 6,320 m, with depths by the walls up to 10 m. The port can handle transports of the "Ro-Ro" class, container ships as well as handle transit cargo to neighboring

Arab countries. The approach to the port is through a channel 7.2 km long with depths of 8.5 m. On the piers are over 65 cranes of varying cargo capacity, up to 30 covered storage areas have been built (with a total floor area of 200,000 m^2), open areas for cargo (more than 380,000 m^2), refrigerated warehouses (8,800 m^3), a shipyard, a flour mill and a slip. The port can handle minor repairs (gyrocompasses, radar and electronic equipment). At present, work is being continued to construct and reequip the piers for receiving transports of the "Ro-Ro" class and container ships and additional equipment is being installed. Annual cargo turnover of the port is 3.5 million tons.

Shuayba (29° 2' N. lat., 48° 9' E. long.) is basically designed for supplying the industrial enterprises of the nation, and for receiving container ships and "Ro-Ro" class transports. It consists of three areas with 19 berths with a total length of around 3,000 m (depth to 17 m). In the port are covered storage facilities for cement and fertilizers. Two breakwaters have been built 530 and 350 m long. Cargo turnover is 6.5 million tons a year.

Mina al Ahmadi (29° 4' N. lat., 48° 10' E. long.) is an oil exporting port which has a mooring platform 11.9 km offshore with oil lines as well as 12 piers with a total length of 1,280 m with depths by the walls up to 18 m. Each year around 90 million tons of oil are shipped out through it.

Mina Abdallakh (29° 1' N. lat., 48° 12' E. long.) is an oil exporting port. It has two roadstead berths some 3 km offshore (depth to 19 m), where two oil lines have been built. Cargo turnover is 4 million tons of oil and oil products a year.

Mina Saud (29° 45' N. lat., 48° 24' E. long.) is an oil port and has two roadstead berths which are 3 and 4 km offshore (there the depths reach 17 m). Underwater oil pipelines have been built to them. The annual cargo turnover is 5 million tons of crude and oil products.

In the estimate of foreign experts, the presence of a significant number of ports in the countries of the Arabian Peninsula and their broad opportunities for receiving cargo not only make it possible to handle merchant vessels but also meet the needs of the navies of the regional countries as well as those of the United States and other member states of the aggressive NATO bloc.

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CSO: 1801/387

FRENCH ARTILLERY MINE-EMPLACEMENT SYSTEM DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 75-76

[Article by Col (Res) S. Chernov: "A French Artillery Mine-Emplacement System"]

[Text] France has begun developing an artillery mining system designed for the rapid laying of antitank minefields directly in the course of combat using regulation guns of 155-mm caliber.

The basis of the new weapon is the OMI 155 H1 canister artillery shell which contains six belly-attack mines. In the head of the shell is a mechanical remote fuze designed to go off at the set point of the trajectory. The bottom part of the shell's casing is detachable and is held in place by shear screws.

The antitank mine is a small ammunition placed inside a cylindrical-shaped metal housing. Within it is the directional charge with two hemispherical recesses on opposite ends and covered with metal plates. In the middle of the charge is a miniature magnetic proximity fuze designed to activate under the entire projection of the moving armored target. The electric circuit of the fuze includes a self-destruct unit which detonates the mine after a designated period after the mine is live. The total weight of one mine is 1.8 kg (the explosive charge weighs 640 gm), the diameter of the housing is 130 mm and the height is 83 mm.

The OMI 155 H1 shells are fired with a maximum charge and this provides a range of 18,500 m with a muzzle velocity of 650 m per second. At the designated point on the trajectory, the head explosive is activated and as a result of this the pyrotechnic cartridge is ignited and by the force of the gases formed the bottom part of the projectile is separated from the housing and the mines are fired from it. In the released mines the first safety stage is removed, the mines fall to the ground where they become live and then are detonated with the passing of an armored vehicle over them. The explosion of a mine on the surface of the ground breaks the track of a modern tank or pierces its belly.

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CSO: 1801/387

DEVELOPMENT OF AMERICAN 'NIGHT HAWK' HELICOPTER TRACED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) p 76

[Article by Lt Col V. Volin: "The American Night Hawk Helicopter"]

[Text] As the foreign press has announced, the American Sikorsky firm, upon the order of the U.S. Air Force Command, on the basis of the multipurpose army aviation helicopter UH-60A Black Hawk is developing a new helicopter, the HH-60D Night Hawk designed for carrying out missions to search for and rescue crews of aircraft which have been shot down or suffered an accident as well as for landing and evacuating reconnaissance-sabotage groups in the tactical depth of enemy defenses and for carrying out other "special operations." It will replace in the troops the obsolete HH-3 and HH-53 helicopters of the same purpose.

The HH-60D has been designed according to the conventional system with a four-blade main rotor and a tail rotor and a non-retractable tricycle landing gear. Its propulsion unit consists of two T700-GE-401 turboshaft engines each with a shaft power of 1,690 hp.

Beneath the floor of the cargo compartment are additional fuel tanks and this, in the estimates of American specialists, will make it possible to increase the range up to 450 km (with a flight of a variable profile). In addition, the helicopter is equipped with a midair fueling system. Its receiving extendable boom is on the right in the nose of the fuselage.

The piloting and navigation equipment of the Night Hawk helicopter includes a terrain viewing radar which makes it possible to execute the flight under a terrain following mode. There also is an infrared set with a rotating thermoradiation receiver, a small computer, a system for automatic descent and hovering over the ground at a designated height and other equipment. All of this, as the Western press has emphasized, will make it possible for the new helicopter, in contrast to the base model and certain other copters of the given class, to carry out its missions not only during the day but also at night under visual and instrument flight conditions.

The armament of the helicopter includes two 7.62-mm machine guns (these are mounted in the doors of the cargo compartment), four air-to-ground and air-to-air guided missiles. The guided missiles, the canisters with unguided aviation

missiles, the reconnaissance and other equipment, and fuel tanks are suspended on a universal removable mounting system which is positioned in such a manner as not to restrict the machine gun sector of fire. There is also a remote-controlled winch for lowering and lifting personnel in a hovering position.

According to data published in the foreign press, the HH-60D helicopter has the following basic tactical and technical specifications: maximum lift-off weight of 9,980 kg, empty weight 5,730 kg, cruising speed of 240 km per hour, maximum speed of 270 km per hour, vertical rate of climb 3.3 m per second, length of flight around 5 hours, length with turning propellors 19.2 m, height 4.8 m, diameter of main rotor 16.1 m and diameter of tail rotor 3.3 m.

The U.S. Air Force Command by the mid-1990's plans to have in service 155 HH-60D Night Hawk and HH-60E (a simplified version) helicopters. The Western press has stated that the first flight will be made by the new helicopter in March 1984 and the start of deliveries to the aviation units is planned for 1986.

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CSO: 1801/387

SWEDISH NAVAL COMMAND SYSTEM STINA REVIEWED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 76-77

[Article by Capt 2d Rank (Res) V. Mosalev: "The Swedish STINA Naval Command System"]

[Text] The firm Phillips Electronik Industrier (Sweden) have developed for the navy a command system called 9CSI 600 STINA designed for operation, command, control and communications in the operational zone of a navy base. It is the further development of the previously developed system 9CSI 500 STINA installed in two areas on the central part of the Swedish coast for observing and controlling the traffic of merchant vessels in the coastal zone. The new system encompasses a vast area, it possesses high security and a high data transmission rate as well as a high level of automating the processes of detecting maritime objects, processing the information and producing the target designations.

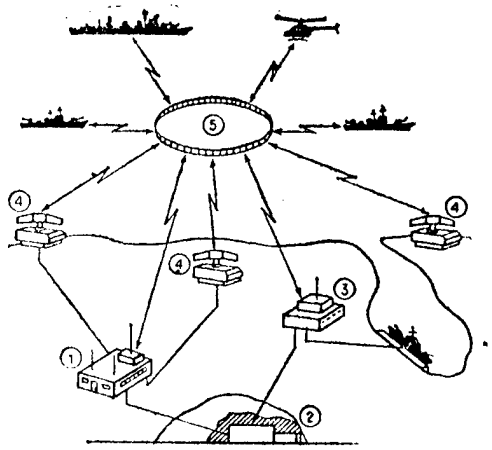

Fig. 1. Structure of the STINA Navy Command System: 1--Basic command center; 2--Protected command center; 3--Naval base command post; 4--Shore radar; 5--Network of high-speed automatic secure communications system.

The 9CSI 600 STINA is based on command centers, detection equipment (chiefly the shore, ship and airborne radars) and communications. It includes a main and protected (underground) command centers, a naval base command post, from three to six shore radars, surface vessels and ASW aviation (see the figure).

The command centers are the main elements of the system. They have the same equipment including three consoles and on the data display devices in color against the background of a map of the region in an alphanumeric form data are illuminated on the location of all the detected targets and friendly forces on a close-to-real time scale, while on television-type screens there is a detailed description of the targets and the friendly forces. This makes it possible for the commander to rapidly take

an optimum decision on utilizing them. The data are processed automatically at the center with the aid of two Phillips P857 processors (storage capacity 128 and 64 K).

Each of the operators at the center can monitor the work of 13 radio channels and 20 telephone lines. Communications between the elements of the system is carried out by phone and in a digital form over cables and the network of high-speed (transmission rate of 4,800 bauds) automatic secure communications system with time separation of the channels. In one cycle of its work, all the correspondents successively transmit information over the constant time interval assigned to them and measured by microseconds. Due to this hundreds of users can be connected to the system. Each correspondent, depending upon his information requirements, can be assigned from one to several-score time intervals. Moreover, secure microphone radio communications can be provided between them. The system 9CSI 600 STINA makes it possible simultaneously to track up to 400 targets, including up to 200 automatically.

Between the centers of the systems deployed in other areas it is possible to exchange information in a digital form and this makes it possible to transmit all data on the detected target as it moves into the zone of responsibility of another center.

The STINA system is to be set up in the areas of the cities of Goteborg, Karlskrona and Malamo.

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CSO: 1801/387

NEW ISRAELI SHIP-BASED ANTIAIRCRAFT MISSILE DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 84 (signed to press 8 May 84) pp 77-78

[Article by Capt 1st Rank (Res) N. Nikolayev: "A New Israeli Shipboard Antiaircraft Missile Complex"]

[Text] Israel is developing a short-range shipboard antiaircraft missile complex called the PDM (Point Defense Missile) with a range from 300 to 10,000 m. According to a statement by the Israeli military specialists, it is designed to protect small-tonnage ships (around 400 tons) against low-flying aircraft and cruise missiles as well as for firing at ships and shore targets. The Israeli Navy Command intends to install the antiaircraft missiles on missile boats of the Reshef class.

The installation should include: the missile, launcher and fire control system.

The PDM missile is a solid-fuel (weight 90 kg) with a cruciform wing. It is to be aimed at the target using a semiactive radar homing head or a radio command system in the event of radar and electronic tracking of the target and missile. In firing at ships and shore installations under good visibility conditions, just the electron-optical tracking system can be used. The warhead (weighing 25 kg) is shrapnel-high explosive, the fuze which is "adaptive" proximity, is connected to an altimeter which prevents its detonating with the flight of the missile over the sea level at a low altitude.

The missile's engine works in three modes. When the missile leaves its container, engine thrust is slight in order to reduce the effect of the gas jet on the ship's rigging. On the launched leg, the engine gives the missile a supersonic speed, developing maximum thrust which on the cruise leg declines and maintains a set speed. On the launch leg, the missile is controlled by gas vanes, and on the cruise leg by air vanes which have a common servomechanism with the former. At the end of the launch leg, the gas vanes are jettisoned.

The launcher is a frame designed to hold eight containers (two rows of four each) and these are designed for the storage and vertical launching of the missiles.

The fire control system includes the radar, the electron optical device and operator console. The firing process has been automated. The response time of the missile complex is 6 seconds.

The Israeli Navy Command assumes that the new missile will make it possible to significantly increase air defense effectiveness of individual ships.

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